M. Library

AUG 13 1943

Medical Library

BRITISH MEDICAL JOURNAL

JOURNAL OF THE BRITISH MEDICAL ASSOCIATION

SATURDAY JULY 31 1943

TABLE OF CONTENTS

Typing of Paratyphoid B Bacilli by Vi Bacteriophage
A. FELIX, D.SC., F.R.S., and BESSIE R. CALLOW, M.A. 127

Phage Typing in Investigation of Paratyphoid B Fever J. R. HUTCHINSON, M.D. 130

Two-stage Amputation in Presence of Sepsis
E. A. JACK, F.R.C.S.Ed., and J. CHARNLEY, F.R.C.S. 131

Pasteurization of Milk and Infant Mortality in Canadian Cities ALAN BROWN, M.D. 133

Ocular Criteria of Riboflavin Deficiency M. K. GREGORY, M.B. 134

Rupture of Rectus Abdominis during Pregnancy RUFUS THOMAS, F.R.C.S.Ed. 136

MEDICAL MEMORANDA

Treatment of Prostatic Carcinoma by Oestradiol and Diethylstilboestrol. G. HARVIE DUNCAN, F.R.C.S. 137
Pseudocyesis Simulated in a Male. WILLIAM BLYTH, M.D. 137

GENERAL ARTICLES AND NEWS

Resuscitation Ward in an E.M.S. Hospital. D. LAMONT, F.R.C.S.Ed. 145
Plaster-of-Paris Wrist Splints. I. H. BAUM, M.B. 139
The F.R.C.S.: Centenary Celebration 140
COMING-OF-AGE OF HOSPITAL SAVING 147
HARBEN AND SMITH AWARDS 147
THE SERVICES 154
UNIVERSITIES AND COLLEGES 153
MEDICAL NOTES IN PARLIAMENT 154
MEDICAL NEWS 156

REVIEWS

Sea Diseases 138
Symptomatology of Cerebral Disease 138
Dermatology and Syphilology 138
Notes on Books 139

OBITUARY

C. J. S. Thompson, PH.D. 153
Bertha Inez Meyer, M.B. 153
Campbell Highet, M.B. 153
H. Wright Thomson, M.D., C.M. 153
W. E. Henderson, M.B., D.P.H. 153
E. N. Darwent, M.D. 153

Epidemiology Section 156

LEADING ARTICLES

Fact and Fancy in Poliomyelitis 141
Resettlement of the Disabled 143

ANNOTATIONS

"Shock" from Venous Occlusion ... 143
Teaching of Ophthalmology 144
Malnutrition in Ceylon 144

LETTERS AND ANSWERS

Risks of Rh Blood Factor—Treatment of Tapeworm Infection—Ending Lactation—Sudden Loss of Hair—Hodgkin's Disease—Visceral Lesions after Muscular Action—London Paste—Income Tax—Plugging Tooth Sockets—Epilepsy—Public Vaccination—First Aid for Fractured Spine—Invasion of Earwigs—Exchange of Raincoats 157–8

SUPPLEMENT

CORRESPONDENCE *17*
A LOCAL VIEW OF STATE MEDICAL SERVICE *18*
MEDICAL RECORDS OF MEN DISCHARGED FROM FORCES *18*
CERTIFICATES OF EVIDENCE OF INCAPACITY *18*
B.M.A. LIBRARY: ORDER CARDS *18*
H.M. FORCES APPOINTMENTS *18*
POSTGRADUATE NEWS *18*

CORRESPONDENCE

Subcutaneous Ligature of Varicose Veins. A. K. MONRO, F.R.C.S. 147
Lectures on Industrial Diseases. JAMES BURNET, M.D. 148
Cutaneous Hypersensitivity to Sulphonamides. A. W. N. DRUITT, M.R.C.S. 148
Transmission of Kala-azar by the Sandfly. J. J. CONYBEARE, M.D. ... 148
Oedema of Extremities at Sea. DUNCAN MACDONALD, M.D. 148
H 11 for Cancer. J. H. THOMPSON, B.SC., P. F. HOLT, PH.D., and R. FORBES JONES, PH.D.; W. E. GYE, M.D., F.R.S., and R. J. LUDFORD, D.SC.; J. A. SCOTT, M.D. 149
Bran in the Diet. Sir LEONARD HILL, M.B., F.R.S. 151
Shortened Puerperium. HELEN YOUNG, M.B.; ADELE NYE, M.B. ... 151
Obstetrical Forceps for Fibroid. J. H. AYTOUN, M.D. 151
The Cult of Negative Health. R. EVELYN LUCAS, M.B.; JANE SCOTT CALDER, M.D. 151
Treatment of Venereal Diseases. IAN M. MCLACHLAN, L.R.C.S. 152
Symptomatology of Malaria. D. M. M. FRASER, M.B. 152
Practice and Precept. S. WRAY, M.B. 152
Whole-time Security. M. ABRAHAMSON, M.B. 152
Health Centres. J. R. M. SANGSTER, M.B. 152

BRITISH MEDICAL ASSOCIATION, TAVISTOCK SQUARE, LONDON, W.C.

No. 4308, WEEKLY, PRICE 1/6

Copyright

REGISTERED AS A NEWSPAPER

Respiratory Emergencies!

SPARKLET RESUSCITATOR

The 'Sparklet' Resuscitator has again and again proved invaluable in the Carbon Dioxide treatment of Respiratory Failure Emergencies.

CO_2 Snow Sticks!

POCKET CO_2 SNOW OUTFIT

With this outfit, CO_2 Snow Sticks are prepared in a few moments, and the treatment of skin blemishes made convenient and economical.

Write for special booklets to Dept. 43

SPARKLETS LIMITED
LONDON, N.16.

The Restricted Diet

To-day, when every diet is restricted, it is necessary to exercise careful discrimination in selecting food for the patient requiring a special diet. In particular it is important to ensure that a full complement of vitamins is given.

Marmite is a yeast extract providing the B group of vitamins. It is usually allowed even when many foods are forbidden.

MARMITE
YEAST EXTRACT

THE MARMITE FOOD EXTRACT CO. LTD.
35, Seething Lane London, E.C.3
437

WARTIME GASTRIC DISORDERS

'BiSoDoL' is the result of painstaking research and extensive clinical trial.
A finely-divided powder, easily miscible with milk or water, it is especially well suited to the treatment of gastric disorders frequently resulting from a change of occupation.
Symptoms of nausea, flatulence and dyspepsia respond well to its sedative properties. Incorporation of the enzymes, papain and diastase, ensures completion of the digestive processes.
Mag. Carb. Levis., in addition to exerting an antacid action, is effective in counteracting any tendency to constipation.

BiSoDoL

BISODOL LIMITED, 12 CHENIES ST., LONDON, W.C.1

. . . . is one of the valuable properties of NYLON, the super synthetic material for sutures. Toughness, strength and uniform thickness are others.

NYLON is water-resistant, and does not become soggy in water or steam at the temperatures normally used for sterilising. Available in 14-inch lengths from usual medical supply houses. Ask for pattern card.

NYLON
(non-absorbable)
SUTURES

IMPERIAL CHEMICAL INDUSTRIES LTD.

P.B.1

BRITISH MEDICAL JOURNAL

LONDON SATURDAY JULY 31 1943

TYPING OF PARATYPHOID B BACILLI BY MEANS OF Vi BACTERIOPHAGE*

BY

A. FELIX, D.Sc., F.R.S. AND BESSIE R. CALLOW, M.A.

(*From the Emergency Public Health Laboratory Service*)

An account was given in a previous paper (Felix, 1943) of experience with the bacteriophage typing of typhoid bacilli according to the technique of Craigie and Yen (1938a, 1938b). The conclusion reached was that the method is an indispensable laboratory aid to the control of typhoid fever. In this country during the past few years paratyphoid B fever has been much more prevalent than typhoid fever. It appeared, therefore, highly desirable to investigate the possibility of applying Vi-bacteriophage action to the examination of paratyphoid B cases and carriers.

The presence in cultures of *Bact. paratyphosum* B of an antigen resembling the typhoid Vi antigen was described some years ago (Felix and Pitt, 1936), but most workers paid little attention to this finding. Kauffmann (1936a, 1936b) attempted to identify the antigen with one of the several components of the complex O antigen assigned to the paratyphoid B bacillus in the Salmonella scheme of Kauffmann and White (Salmonella Subcommittee, 1934). The intricacies of this controversial problem cannot be discussed here, but it may be stated that unpublished experiments carried out by one of us (A. F.) in collaboration with Miss R. M. Pitt before the war strongly indicated that paratyphoid B bacilli possess a heat-labile somatic antigen that is essentially similar to the typhoid Vi antigen, though differing from it in certain respects. Moreover, experience during the present war confirms the earlier observation, and every paratyphoid B strain isolated in this country which has been examined up to the present time contains the heat-labile "Vi" antigen.

These facts are the theoretical basis of the present investigation. The data from the bacteriological and serological experiments will be published elsewhere; only those results are summarized here which help to make clear the practical application of the method.

Isolation of Anti-Vi and Anti-O Bacteriophages

During 1941 large outbreaks of paratyphoid B fever occurred in different parts of the country, and, thanks to the co-operation of many pathologists, nearly 500 cultures of the paratyphoid B bacillus were collected and examined within a few months. Bacteriophages were grown from specimens of faeces of paratyphoid B patients, convalescents, and carriers; from freshly isolated "smooth" cultures that were found to be phage-contaminated; and from "rough" variants of paratyphoid B strains; a few bacteriophages were also received from Dr. R. Knox of the E.P.H. Laboratory, Leicester. It was soon found that most of the phages obtained from these sources were anti-O phages that acted on paratyphoid B bacilli as well as on *Bact. typhi-murium* bacilli and many other members of the Salmonella group. Even minor O-antigenic components that are common to the various Salmonella species, though they are not listed in the Kauffmann–White diagnostic scheme, provide an adequate point of attack for anti-O bacteriophages.

On the other hand, a number of phages were found which were specific for the paratyphoid B bacillus. These phages did not attack any of the other Salmonella species tested, and were therefore considered to be specific anti-Vi paratyphoid B phages. They differed, however, in one respect from the corresponding typhoid Vi phages described by Sertic and Boulgakov (1936), Scholtens (1936), and Craigie and Brandon (1936). The typhoid Vi phages, when employed in the form of concentrated unadapted preparations, attack every strain, or almost every strain, of the typhoid bacillus, so long as the bacilli contain enough of the Vi antigen to provide the required point of attack. Our Vi paratyphoid B phages, however, acted selectively on certain paratyphoid B strains but failed to lyse other strains, in spite of the fact that these also contained the heat-labile somatic Vi antigen.

It is noteworthy that the non-specific O phages were grown readily from specimens of faeces, whereas the specific Vi phages could be isolated only exceptionally from this source. Thus, of the first ten anti-O phages examined seven were derived directly from faecal specimens and three were isolated during the process of purification of Vi phages, which was in each instance carried out by repeated transplantation from single plaques. On the other hand, the first ten anti-Vi phages were obtained from the following sources: five from lysogenic "rough" variants, four from phage-contaminated "smooth" cultures of the paratyphoid B bacillus, and only one direct from a specimen of faeces.

Although the Vi bacteriophages had been isolated from patients in localities as widely separated as Aberdeen and Inverness in the north, and Bristol and Exeter in the south, no difference in their affinities for different paratyphoid B strains could be detected. Every strain examined was either lysed by all the Vi phages or was resistant to all of them, no matter in which part of the country the strain had been isolated. All the strains examined during any given outbreak usually behaved in a precisely similar manner towards all the available Vi phages; this was interpreted as indicating that the cases had a common source of infection. Such confirmation by laboratory findings, though of limited value, was appreciated by the medical officers of health who were investigating the outbreaks (Davies, Cooper, and Fleming, 1942; Parry, 1942). There seemed, however, at that time to be little hope of attaining our goal—namely, the differentiation of paratyphoid B strains into a number of distinct Vi-phage types. As was proved later, nearly all the larger outbreaks during 1941 were due to strains belonging to the same bacteriophage type—namely, Type 1 (see Table III).

Adaptation of Vi Bacteriophages

The position at once changed when the first instance of adaptation of a Vi phage had been observed. This occurred in the course of the examination of cultures from a relatively small outbreak of paratyphoid B fever in Ipswich during July–Aug., 1941. Thanks to the most helpful co-operation of Dr. P. H. Martin of the E.P.H. Laboratory, Ipswich, we were able to examine the strains from all the patients concerned and also from a number of cases that occurred at the same time elsewhere in East Suffolk. The "Suffolk" strains were all lysed by the available Vi phages in very high dilutions, exceeding in some instances even a dilution of 1 in 10 millions, whereas the "Ipswich" strains were all insusceptible. When,

* A report to the Medical Research Council.

however, certain of the phage preparations were applied in a concentration about a million times stronger than the usual amount a few plaques were occasionally produced on some of the "Ipswich" strains. New preparations of bacteriophage grown from these plaques still lysed the "Suffolk" strains, but they also lysed the "Ipswich" strains to the same titre. Using one of the original Vi phages, which had been isolated from a patient in Aberdeen, and the new preparation derived from the "Aberdeen" phage and adapted to the "Ipswich strains, we were now able to identify every strain that belonged to the "Ipswich" type.

The next Vi phage to be specifically adapted to certain strains was obtained by an analogous procedure during the examination of strains from a small outbreak in Southampton. The cultures had been isolated by Dr. J. T. Duncan of the E.P.H. Laboratory, Winchester, during May–June, 1940, and were found to be resistant to all the original Vi phages, including the "Aberdeen" phage and the adapted "Ipswich" phage. After numerous unsuccessful attempts a few plaques were eventually produced by the adapted "Ipswich" phage on some of the Southampton strains, and from these plaques another adapted phage was initiated. The new phage preparation possessed a strong lytic power for all the cultures from the Southampton outbreak, but had entirely lost the lytic power for the "Ipswich" strains which it had acquired during the previous process of adaptation. Its affinity for the parent strain ("Aberdeen" strain) still remained unchanged. The original "Aberdeen" Vi phage was now labelled "Type 1," and the adapted "Ipswich" and "Southampton" phages were designated as "Type 2" and "Type 3" respectively.

TABLE I.—*Showing the Reactions of Type Strains of Bact. paratyphosum B and Bact. typhi-murium to Anti-Vi and Anti-O Bacteriophages*

Type Strains		Antigens Present in the Strains	Anti-Vi Bacteriophages					Anti-O Bacteriophage
			Bact. paratyphosum B				Bact. typhi-murium Type 1	
			Type 1	Type 2	Type 3a	Type 3b		
Bact. paratyphosum B	Type 1 ..	Vi+O	CL	CL	CL	+++	–	CL
	,, 2 ..	Vi+O	–	CL	–	–	–	CL
	,, 3a	Vi+O	–	–	CL	SCL	–	CL
	,, 3b	Vi+O	–	–	–	SCL	–	CL
	Untypable (Group Z)	Vi+O	–	–	–	–	–	CL
Bact. typhi-murium	Type 1 ..	Vi+O	–	–	–	–	CL	CL
	Vi-negative variant	O	–	–	–	–	–	CL

CL = Confluent lysis with standard loopful of test dilution of phage.
SCL = Semi-confluent lysis with standard loopful of test dilution of phage.
+++ = Numerous discrete plaques, subnormal in size.

So far only four different Vi-phage types of *Bact. paratyphosum* B have been identified; their relationship to each other is indicated in Table I. Type 1 strains are lysed by all the available BVi* phages, whereas the other three types are attacked only by the corresponding adapted BVi phages. Group Z is the provisional designation chosen for the untypable strains that are resistant to all the BVi phages so far available in spite of the fact that the cultures contain the BVi antigen. There can be little doubt that this group comprises a number of further Vi-phage types that have not been identified because the corresponding type phages have not yet been isolated.

If the typing scheme outlined in Table I is compared with that which was first devised by Craigie and Yen (1938a) for the typing of the typhoid bacillus it is seen that the two are very similar, and indeed almost identical. The first place in each of the two schemes has been assigned to the type of bacillus that is sensitive to all the adapted phage preparations; the phages corresponding to these types—namely, Type A phage of the typhoid bacillus and Type 1 phage of the paratyphoid B bacillus—nevertheless possess a high degree of specificity. The remaining types in the two schemes are all characterized by their particular sensitiveness to the homologous adapted type phage. The relationship between subtypes of the paratyphoid B bacillus (Types 3a and 3b) is also similar to that obtaining between the various subtypes of the typhoid bacillus.

* The symbol BVi is used throughout this paper to denote the Vi antigen of the paratyphoid B bacillus.

Bacteriophages adapted to Types 2, 3a, and 3b were isolated many times later in the course of this investigation. These phage preparations were obtained as the result of cross-reactions between cultures and Vi phages that had been derived from outbreaks or sporadic cases in various parts of the country. Whichever of these phage preparations were employed in the typing of paratyphoid B strains, the results obtained were invariably the same—namely, identical with those summarized in Table I.

The table also shows that *Bact. typhi-murium*, which shares the heat-labile Vi antigen with *Bact. paratyphosum* B (Felix and Pitt, 1936), is not lysed by any of the four BVi-type phages. *Bact. typhi-murium* is sensitive to its own specific Vi phages, of which two different types have been identified so far. Table I shows only one of these. It remains to be investigated whether the specificity of these phages is as strict as it appears to be at the present time.

The procedures that led to the adaptation of anti-Vi phages were also applied to the examination of a number of anti-O phages. In no instance, however, did we succeed in training an anti-O phage to develop strain specificity. This finding is of great interest, from the theoretical point of view, since it provides additional evidence of the similarity between the Vi antigen of typhoid and that of paratyphoid B bacilli. Table I shows that an anti-O phage attacks strains belonging to all known Vi-phage types of the paratyphoid B bacillus and also Vi-positive and Vi-negative strains of *Bact. typhi-murium*.

The Epidemiological Significance of Paratyphoid-B Vi-phage Types

It has already been mentioned that the subdivision of paratyphoid B strains into Vi-phage types first proved its usefulness during a small outbreak in Ipswich, July–Aug., 1941, which was examined bacteriologically by Dr. P. H. Martin. The epidemiology of this outbreak has been very thoroughly investigated by the Ministry of Health, in co-operation with the E.P.H.L. Service, and a report by Dr. J. R. Hutchinson appears on page 130 of the present issue (Hutchinson, 1943). The clear-cut result of the field inquiry was that all the cases from which Type 2 bacilli had been isolated had a common source of infection, whereas the cases that were due to Type 1 bacilli were unrelated to that source.

Many outbreaks, large and small, have been investigated since, and our experience so far has been that the epidemiological significance of paratyphoid-B Vi-phage types is much the same as that of the now well-established typhoid Vi types. A few instances may be mentioned here by way of illustration. During the paratyphoid B outbreak in Liverpool, May–Sept., 1941 (Holt, Vaughan, and Wright, 1942), 72 cultures, derived from 66 patients or temporary excreters, were examined. These included cultures isolated from three employees of the bakery responsible for the outbreak and from a synthetic cream used by the firm in question. All these cultures were found to belong to Type 1. In an outbreak in Bristol, July–Oct., 1941 (Davies, Cooper, and Fleming, 1942), five strains from the primary wave in August and six strains from the secondary wave in September were typed, and it was found that again all the cultures were of Type 1. On the other hand, thirteen strains from the outbreak in Consett, June, 1940 (Warren, 1941), and six strains from the 1939 outbreak in Bebington (Hughes and Harwood, 1940) were typed, and all were found to belong to Type 3a.

Several chronic faecal carriers of *Bact. paratyphosum* B have been examined repeatedly over periods varying from a year to over three years. The phage type of the excreted organism in every instance remained unchanged during the period of observation. These results permit us to state with confidence that the typing of paratyphoid B bacilli by the Vi-phage technique is a reliable aid to the epidemiological investigation of cases or outbreaks of the disease.

Paratyphoid-B Vi-phage Types Prevalent in England, Wales, and Scotland during 1940-2

The results so far obtained with the typing of strains of the paratyphoid B bacillus have been summarized in Tables II and III. The number of cultures examined in the course of this investigation was 808, including about 100 cultures from the late W. M. Scott's collection; the number of patients and

carriers, temporary or chronic, from whom the cultures had been derived was 714. Many paratyphoid B outbreaks of considerable size occurred in the British Isles during 1941, and nearly all of these were due to Type 1 bacilli. As a sequence to these outbreaks, cultures of Type 1 strains from convalescent patients and temporary excreters continued to be sent in for examination throughout the following winter and well into the first quarter of 1942. It seemed advisable, therefore, to choose March 31, 1942, as the date separating the "epidemic" year 1941 from the "non-epidemic" period that followed it. The distribution of the various types during the three years under observation can thus be traced more accurately than by strictly adhering to yearly periods.

TABLE II.—*Showing the Vi-phage Types of Bact. paratyphosum B found in England, Wales, and Scotland during April, 1940, to March, 1943*

Part I

Vi-phage Types of Bact. paratyphosum B	Number of Patients and Carriers from whom Paratyphoid B Strains belonging to the Various Vi-phage Types have been Isolated					
	April, 1940, to Dec., 1940		Jan., 1941, to March, 1942		April, 1942, to March, 1943	
	No.	%	No.	%	No.	%
Type 1	95	55·6	349	79·3	37	41·1
„ 2	5	2·9	34	7·7	3	3·3
„ 3a	51	29·8	33	7·5	38	42·2
„ 3b	1	0·6	4	0·9	1	1·1
Untypable (Group Z)	19	11·1	20	4·6	11	12·2
Total	171		440		90	

Part II.—Notified Cases of Enteric Fevers in England and Wales

	1938	1939	1940	1941		1942
				Jan.–June	July–Dec.	
Typhoid fever ..	—	—	—	—	677	464
Paratyphoid fever ..	—	—	—	—	2,941	404
Total typhoid and paratyphoid fevers	1,322	1,479	2,833	1,145	3,618	868

In order to assess the significance of the figures shown in Part I of Table II it is necessary to emphasize that the method of collecting the cultures for typing has not been the same throughout the whole period under review. During the initial stages of the investigation it was felt that no useful information could be obtained from the examination of sporadic cases or small groups of cases, and these were neglected almost entirely. Most of the cultures collected during 1940 and 1941 were therefore obtained from cases belonging to larger outbreaks of the disease. In March, 1942, when the number of available Vi-type phages had risen to three, it was decided to extend the investigation to include strains from sporadic cases or from small groups of cases. This change was a timely one, since the year 1942 proved to have the lowest number of notified cases of enteric fevers ever recorded in England and Wales. The total notifications, based on the weekly returns of the General Register Office, are shown for comparison in Table II.

The typing of a small fraction of the total number of cases, such as has only been possible up to the present time, obviously provides a very rough indication of the frequency-distribution of the different Vi-phage types. Carefully organized surveys, covering all parts of the country and carried out for a number of years, are required in order to obtain a reasonably adequate picture. It is, however, clear that the figures for 1940 and 1942 approximate more closely to the true frequency-distribution of the various types than the 1941 figures, which reflect the epidemic spread of Type 1 bacilli. The prevalence of this type during 1941 was obviously due to accidental causes, and not to any particular virulence of Type 1 bacilli.

It is of especial interest to note that the proportion of strains that could not be typed with the four type phages so far available has been very small. The highest figure was that for 1942—namely, 12% of the total number examined. In a similar series of cases of typhoid fever from this country (Felix, 1943) the proportion of untypable strains was slightly higher (69 out of 432 strains, or 15.9%). These figures are remarkable in view of the fact that the typhoid strains were tested against twenty-two different Vi-type phages, whereas only four phages were available for the typing of paratyphoid B bacilli. The significance of these observations is at present a matter for speculation. It is possible that by mere chance only a small number of the different Vi-phage types of paratyphoid B bacilli that are indigenous to this country were encountered during the present investigation. An alternative possibility is that the Vi antigen of *Bact. paratyphosum* B is not capable of variation to the same degree as the Vi antigen of *Bact. typhosum*—that is to say that the former has developed fewer Vi-phage types than the latter. Future investigations in this country and abroad will give the answer to these queries.

Paratyphoid B bacilli do not lose their specific Vi antigen as readily as do typhoid bacilli. In the corresponding series of strains of *Bact. typhosum* that had been typed by the bacteriophage technique (Felix, 1943) eight strains could not be typed because the cultures were Vi-negative "O" variants. In the present series of 714 strains of *Bact. paratyphosum* B

TABLE III.—*List of Phage-typed Outbreaks of Paratyphoid B Fever in England, Wales, and Scotland*

Outbreaks				Strains of Bact. paratyphosum B examined by the Vi-phage Method			Reference
Year	Months	Place	No. of Cases Notified	No. of Strains Typed	Vi-phage Type	Cultures received from	
1931	Feb., March	Epping and district	312	2	1	Metropolitan Water Board	Bullough (1931)
1936–7	Dec., Jan.	Liverpool and district	132	2	1	Prof. H. D. Wright	Frazer, Glover, and Glass (1937)
1939	Aug.–Oct.	Bebington	51	6	3a	Dr. H. H. Mole	Hughes and Harwood (1940)
1940	April	Southampton	10	6	3a	E.P.H. Laboratory, Winchester	—
	June	Consett and district	56	13	3a	E.P.H. Laboratory, Barnard Castle	Warren (1941)
	June–Sept.	Kettering and district	213	18	1	E.P.H. Laboratory, Leicester	Hogg and Knox (1941)
	July, Aug.	Exeter	60	29	1	Dr. W. A. Robb	Page (1940)
	May, June	Bristol	34	3	1	Dr. K. E. Cooper	Davies, Cooper, Wiseman, and Davies (1940)
	Aug.–Dec.	Sheffield	39	7	3a	Prof. Wilson Smith	—
1941	March	Inverness and district	200	5	1	Dr. H. J. R. Kirkpatrick	—
	May	Dundee	178	3	1	Prof. W. J. Tulloch	—
	June	Taunton	28	6	Group Z	D. R. Wood, F.I.C.	—
	May–Sept.	Liverpool and district	883	72	1	Prof. H. D. Wright	Holt, Vaughan, and Wright (1942)
	May–Oct.	Birmingham and district	254	63	1	Dr. H. Henry	—
	July–Oct.	Bristol	203	11	1	Dr. K. E. Cooper	Davies, Cooper, and Fleming (1942)
				12	1	American Red Cross–Harvard Unit	
	July, Aug.	Ipswich	16	16	2	E.P.H. Laboratory, Ipswich	Hutchinson (1943)
	Sept.	East Hampshire	33	11	1	E.P.H. Laboratory, Winchester	—
	Oct., Nov.	St. Albans	21	11	1	Prof. L. P. Garrod	—
	Dec.	Torquay	6	4	Group Z	E.P.H. Laboratory, Exeter	—
1942	Jan.	Ely	10	4	1	E.P.H. Laboratory, Cambridge	E.P.H.L.S. Monthly Bulletin, April, 1942
	April	Locking	15	6	3a	D. R. Wood, F.I.C., Taunton	—
1943	Jan.	Hastings	35	10	3a	Dr. P. Lazarus-Barlow	—

not a single strain remained untyped for that particular reason. All the cultures listed in Table II as untypable (Group Z) strains were examined in agglutination tests with pure O and pure Vi immune sera and were found to contain the heat-labile BVi antigen. On the other hand, paratyphoid B cultures that show the accepted criteria of "roughness" (Arkwright, 1930) cannot be typed. According to the degree of antigenic degradation which they have suffered, such cultures may or may not be lysed by anti-O phages; they are, however, invariably resistant to the action of anti-Vi phages.

Table III shows in chronological order those outbreaks of paratyphoid B fever in the British Isles that have been typed by the Vi-phage method. Many of these outbreaks have been described in detail in published reports, and the various epidemiological aspects raised by the authors have been reviewed in an interesting study by Savage (1942). No published accounts are available of those outbreaks mentioned in Table III to which no reference is printed in the table. The information concerning these outbreaks has been supplied by the pathologists from whom the cultures were received and by the General Register Office. The figures specified in Table II, when read in conjunction with the data recorded in Table III, will convey an indication of the distribution of the various types of paratyphoid B bacilli throughout the country. Table III shows that all the large outbreaks that occurred during 1941 were due to Type 1 bacilli.

This first survey of necessity furnishes only fragmentary information, but it shows clearly the scope of applicability of the new typing method. Its value as an epidemiological weapon is beyond doubt. The extent to which it can be usefully applied to the control of paratyphoid B fever depends solely upon the degree of co-operation between clinician, field investigator, and laboratory worker.

Summary

Anti-Vi bacteriophages that act specifically on *Bact. paratyphosum* B are described. Anti-O bacteriophages, on the other hand, attack strains belonging to many diverse Salmonella species.

Anti-Vi phages of *Bact. paratyphosum* B can be adapted to develop a high degree of specificity for particular strains, whereas anti-O phages are incapable of such adaptation.

Four separate and distinct Vi-phage types and subtypes of *Bact. paratyphosum* B have been identified so far, and a method of typing strains of paratyphoid B bacilli has been developed similar to that which was first devised by Craigie and Yen for the typing of typhoid bacilli.

Of 714 strains isolated from patients or carriers in Great Britain only 50 (7%) could not be typed by means of the available four Vi-type phages. The larger outbreaks of the disease in 1941 were found to have been caused by Type 1 strains.

The significance of paratyphoid-B Vi-phage types is the same as that of typhoid Vi-phage types. The typing of paratyphoid B strains isolated from sporadic cases or outbreaks is a valuable epidemiological weapon and is certain to be widely applied in the future.

We should like to express our thanks to the pathologists of the Emergency Public Health Laboratory Service and of many other public health or clinical laboratories for their co-operation throughout this investigation; to Dr. J. R. Hutchinson, Dr. W. H. Bradley, and Colonel C. Maddock of the Ministry of Health for help in collecting epidemiological data; and to Dr. C. M. Wenyon for hospitality at the Wellcome Research Institution.

REFERENCES

Arkwright, J. A. (1930). *System of Bacteriology*, **1**, 349, Med. Res. Cncl., London.
Bullough, W. A. (1931). Ann. Rep. County M.O.H. Essex.
Craigie, J., and Brandon, K. F. (1936). *J. Path. Bact.*, **43**, 233.
—— and Yen, C. H. (1938a). *Canad. publ. Hlth. J.*, **29**, 448.
—— —— (1938b). Ibid., **29**, 484.
Davies, I. G., Cooper, K. E., and Fleming, D. S. (1942). *Lancet*, **1**, 129.
—— —— Wiseman, J., and Davies, J. M. (1940). Ibid., **2**, 778.
E.P.H.L.S. Monthly Bulletin, April, 1942.
Felix, A. (1943). *British Medical Journal*, **1**, 435.
—— and Pitt, R. M. (1936). *Brit. J. exp. Path.*, **17**, 81.
Frazer, W. M., Glover, B. T. J., and Glass, V. (1937). *British Medical Journal*, **2**, 369.
Hogg, C. B., and Knox, R. (1941). *J. Hyg.*, Camb., **41**, 553.
Holt, H. D., Vaughan, A. C. T., and Wright, H. D. (1942). *Lancet*, **1**, 133.
Hughes, T. L., and Harwood, H. F. (1940). Ibid., **2**, 601.
Hutchinson, J. R. (1943). *British Medical Journal*, **2**, 130.
Kauffmann, F. (1936a). *Z. Hyg. InfektKr.*, **117**, 778.
—— (1936b). Ibid., **118**, 318.
Page, G. B. (1940). Ann. Rep. M.O.H. Exeter, p. 21
Parry, S. C. (1942). *British Medical Journal*, **2**, 661.
Salmonella Subcommittee (Nomenclature Comm. int. Soc. Microbiol.) (1934). *J. Hyg.*, Camb., **34**, 333.
Savage, W. G. (1942). *J. Hyg.*, Camb., **42**, 393.
Scholtens, R. T. (1936). Ibid., **36**, 452.
Sertic, V., and Boulgakov, N. A. (1936). *C. r. Soc. Biol.*, Paris, **122**, 35.
Warren, S. H. (1941). *Publ. Hlth.*, **54**, 139.

A NOTE ON THE VALUE OF PHAGE TYPING IN THE INVESTIGATION OF AN OUTBREAK OF PARATYPHOID B FEVER

BY

J. R. HUTCHINSON, M.D., D.P.H.
Senior Medical Officer (Epidemiology), Ministry of Health

Felix (1943) recently related his experiences of the typing of typhoid bacilli by means of Vi bacteriophage (Craigie and Yen, 1938), and in a companion article Bradley (1943) gave an account of the first application of this new knowledge to field investigations in this country, and proved, in peculiarly difficult circumstances, its value to epidemiologists. As a natural corollary Felix and Callow proceeded to apply a like laboratory technique to *Bact. paratyphosum* B—the preliminary results of which are reported on page 127 of this issue—and an opportunity recently occurred of ascertaining whether the harmony between the laboratory and field findings demonstrated in typhoid also held in paratyphoid B fever.

In Ipswich in late July and early August, 1941, there were twelve primary cases of paratyphoid B fever notified from twelve different addresses in the town. Ten of the patients had not eaten any food away from home for many weeks. By the courtesy of Dr. Hunter, the medical officer of health, and Dr. P. H. Martin of the Emergency Public Health Laboratory Service, cultures of the causal organism recovered from the stools of all the patients were submitted to Felix for phage typing. He found that ten of the patients were excreting *Bact. paratyphosum* B Type 2 and two of them Type 1. Colonel Maddock, a Medical Officer of the Ministry, made local inquiries and ascertained that, although no history of the consumption of one common article of food or drink from one source could be obtained, all the ten patients who had had no meals away from home had, at a material time, a common source of supply of "confectionery" from a shop in which an unattended case was found in the person of a daily domestic helper. There was no other common factor. This woman had continued at work for four weeks after she began to be ill, but ceased on Aug. 13, by which time she had infected her daughter, who lived with her. The helper's duties took her into the shop (she had no access to bulk supplies), and although they did not ordinarily include the handling of confectionery, there is ample evidence that she did this and also assisted in conveying unwrapped confectionery from the bakery on the premises into the shop. The bakery supplied confectionery in bulk to certain other shops, to which no cases were traceable, and all the ten patients implicated were those who were excreting *Bact. paratyphosum* B Type 2. Moreover, the same type was recovered from the stools of the two secondary cases. Of the two primary cases excreting Type 1 bacilli neither had had any dealings with the shop in question. One was staying in another part of Suffolk and the other at a town in the Midlands.

From the beginning of 1941 to the time of the investigation fifteen cases of paratyphoid B fever had been notified from twelve different parishes scattered throughout seven administrative districts in the county (i.e., outside Ipswich), and the conjectured dates of infection of seven of the primary cases fell within the period during which the source of infection was present in the Ipswich shop. Two of the seven were found to be excreting Type 2, the others Type 1. Both the former lived in parishes contiguous to Ipswich and were regular customers of the implicated shop.

All the primary Type 2 cases in Ipswich and the immediate neighbourhood, therefore, were associated with one particular shop in which an excreter of Type 2 was handling foodstuffs at a material time. There was thus complete harmony between the laboratory and the field findings.

REFERENCES

Bradley, W. H. (1943). *British Medical Journal*, **1**, 438.
Craigie, J., and Yen, C. H. (1938). *Canad. publ. Hlth. J.*, **29**, 448, 484.
Felix, A. (1943). *British Medical Journal*, **1**, 435.
—— and Callow, B. R. (1943). Ibid., **2**, 127.

THE TWO-STAGE AMPUTATION

PRIMARY PLANNED AMPUTATION IN THE PRESENCE OF SEPSIS

BY

E. A. JACK, M.B., F.R.C.S.Ed.
Major, R.A.M.C.

AND

J. CHARNLEY, M.B., F.R.C.S.
Major, R.A.M.C.

(No. 2 Orthopaedic Centre, M.E.F.)

Amputations in battle casualties at some interval after wounding present two main problems—namely, the level at which amputation should be performed, and the procedure to be adopted in dealing with the stump. Sepsis is the bogy. There is no doubt that if a formal flap amputation is performed a large proportion of the wounds become infected, with immediate danger to life and ultimate detriment to the stump. Authoritative publications unanimously recognize this fact, and explain it on the grounds that some hours after injury organisms invade the surface of the wound and migrate up the lymphatics of the limb. From the lymphatics they become liberated into the amputation stump. The M.R.C. War Memorandum No. 5 (1941) states that if 24 hours have elapsed since wounding infection of the amputation stump is almost inevitable; the American Medical Association *Handbook on Amputations* (1942) presents similar views, but puts the limits of the safe period at 12 hours; while other authorities vary between these times.

If infection of the stump is thus accepted as inevitable the only alternatives are either a low guillotine operation, with formal site-of-election amputation when all danger is passed, or a flap amputation at the site of election, the flaps being left widely open until sepsis subsides. Verrall (1941) suggests that it is sufficient to stitch the flaps loosely, with adequate drainage. During recent campaigns in the Middle East many cases have been received from the forward areas treated by these methods, and their subsequent behaviour has been observed. The flap amputation with loose suture or without suture was commonly performed during the Second Libyan Battle. During the Third Battle the low guillotine method was more in favour.

Of the former group few cases may be said to have pursued a satisfactory course. Almost all of the wounds became infected at some stage in the treatment, and the loose flaps became oedematous and retracted. A large discharging wound presented on which secondary suture was rarely possible, and the stumps healed only after a prolonged period of granulation. The eventual scar was often thin, puckered, and adherent to bone. If further plastic procedure on the stump is necessary and involves shortening of the bone, valuable length is lost.

The cases on which the low guillotine operation had been performed obtained perhaps, in the long run, the better end-results, because the final amputation was planned, but in the early stages their course was equally depressing. The misery of the large painful raw area, again frequently the site of prolonged infection, needs no elaboration. Reamputation is necessary, and on a patient who is just recovering from a severe ordeal the psychological effect of the news that a further portion of the limb must be lost is not the least of the disadvantages. Moreover, there is no guarantee that the final stump will remain aseptic unless the second amputation is delayed for a long time.

Experience of these methods yielded nothing but dissatisfaction at the prolonged morbidity which they entail.

Sources of Infection in the Amputation Stump

Infection may gain access to the amputation stump in three ways: (1) organisms may be present in the lymphatics and escape from them into the wound; (2) organisms may enter the wound from the skin edges or along drainage-tubes; (3) the wound may be contaminated at operation. The second source is perhaps a very common one in battle casualties, in which multiple wounds, burns, or abrasions so often affect the skin close to the amputation field.

In the formal flap amputation, organisms once introduced into the wound find a ready site for multiplication owing to two main factors—the collection of blood or serum, and the release of normal tissue tension.

Unless operation is very much prolonged it is extremely unlikely that absolute haemostasis is achieved before stitching up. Small dead spaces remain between the flaps and about the bone-end which fill with blood-clot, and a tube drain or a loose closure affords nothing more than drainage by overflow. The flaps when cut retract, and are rarely drawn out to their normal tension again by the sutures, so that the circulation is altered in the flaps and there is a tendency to oedema, which renders the tissues more susceptible to infection. A bandage which brings enough pressure to bear at the end of the stump to eliminate pockets and to prevent oedema is almost impossible to apply, because the stump affords no purchase. Loose suturing of the flaps merely to allow drainage invites infection rather than prevents it.

The Two-stage Amputation

The two-stage amputation employs two principles. First, to combat implanted or invading organisms, sulphanilamide powder is introduced into the wound in large quantity to maintain a high local concentration. Secondly, to counter the predisposing conditions a large dry gauze pack is sutured under the flaps with its ends left projecting from the corners of the incision. The pack must be large and it must be of dry gauze. It must be large so that the flaps are sutured over it under moderate tension approximating to that obtaining in normal tissues; it must be of dry gauze so that it is absorbent.

During the first few hours after operation there is an outpouring of serum from the raw surfaces, which soaks into the pack. By the capillary action of the gauze it is conducted out, via the extremities of the pack, into the dressing. At the same time a proportion of the sulphanilamide is dissolved by the serum and carried into the pack, which thus becomes a reservoir containing a solution of sulphanilamide in high concentration. Vaselined gauze will not fulfil these functions. The tension of the flaps over the pack maintains the circulation as nearly normal as possible, and at the same time produces through the medium of the pack an even pressure over the whole surface of the wound, thus preventing oedema and promoting effective haemostasis.

Technique of the Operation

The first stage starts as a standard flap amputation at the site of election. Often the vessels are seen to be surrounded by oedematous connective tissue, signifying lymphatic infection extending up the limb. When haemostasis has been rendered

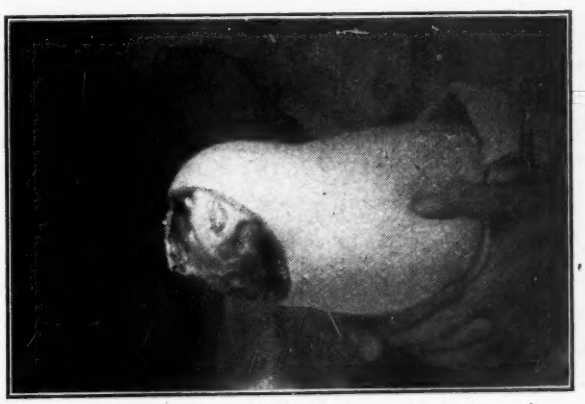


FIG. 1.—Guillotine disarticulation through knee-joint prior to two-stage amputation.

as complete as possible, sulphanilamide powder is coated thickly over the wound. A dosage of 10 g. should not normally be exceeded for a mid-thigh amputation. The dry gauze pack is then introduced. Its size depends on the length of the flaps. Gauze roll folded on itself six or eight times to make a pack an inch and a half to two inches thick is recommended. It is carefully inserted well up into the folds of the flaps, so that it comes into direct contact with the whole surface of the

wound. Its ends project from the corners of the incision. (See Fig. 2.) The flaps are then pulled over it, and anchored with four or five sutures, and a well-padded dressing is applied. During the first 24 hours after operation there is usually some serous soakage through the dressings.

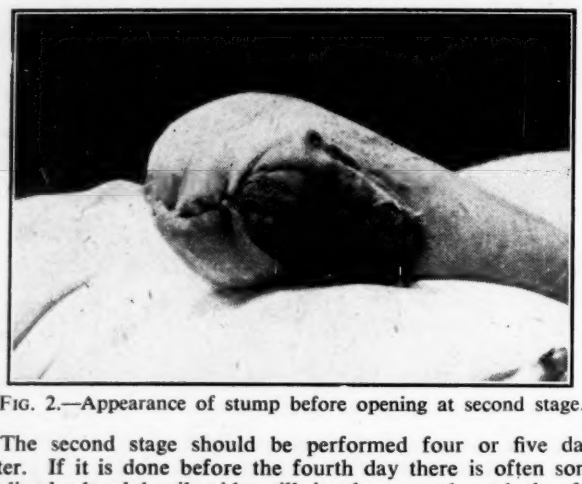


FIG. 2.—Appearance of stump before opening at second stage.

The second stage should be performed four or five days later. If it is done before the fourth day there is often some undissolved sulphanilamide still in the wound, and the full benefit has not been obtained. If left longer than five days there is a tendency for granulation tissue to grow into the pack, and bleeding follows its removal. The second stage must be carried out as a formal operation with the full aseptic precautions. The sutures are cut, the flaps very gently opened, and the pack peeled away from the surface of the wound. The flaps are soft and pliable, and are easily reflected. The wound is clean, dry, and a healthy pink colour. There are no

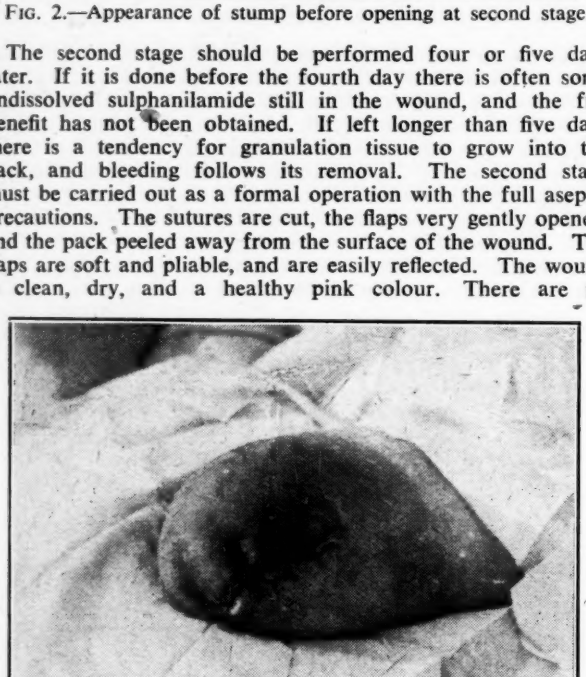


FIG. 3.—Stump before removal of sutures 14 days later.

haematomata. Sometimes about the bone-end there is a small area with a gelatinous appearance suggesting possible mild infection, but on culture this is found to be sterile. A second liberal coating of sulphanilamide powder is introduced, and the flaps are closely sutured without drainage. The sutures should be retained for 14 days.

If during the interval between stages the temperature does not quickly fall to normal, and there are signs of sepsis, the second stage should not be delayed. Should it be found, on removal of the pack, that infection has occurred and that there is suppuration in the wound, no harm has been done. The flaps are left open, and after control of infection a late secondary suture may be feasible.

The use of a dry pack is not claimed as original. It was tried out by one of us (J. C.) on two cases, at a time when site-of-election amputation with loose closure was being performed almost universally on battle casualties with bad results. The trial was satisfactory. Since then the procedure has been gradually evolved until the technique described above is now the routine for all amputations performed in this unit.

Report on Results

The two-stage method has been used in 26 cases, which are now reported.

1. Primary healing without any complication was obtained in 18 cases.

2. In 3 others, after final removal of the stitches, the skin margins slid apart for about half an inch, but quickly healed without sepsis when they were drawn together with strapping. In these cases the stitches were removed only 10 days after the second stage. Whipple (1940) reports that local sulphanilamide seems to delay normal primary wound healing, and as a result of this experience the stitches are now retained for 14 days after the second stage.

3. Three cases developed mild surface sepsis at the skin edges, which did not interfere with the final healing or form of the stump. This group consists of cases in which the method was put to the most rigorous test, and in which closure by ordinary methods would almost certainly have been doomed to failure. Confidence born of success in preceding trials, and a desire to test the efficacy of the procedure to the full, are the excuses for having attempted a closed operation. One was a case of gas gangrene to the elbow, on which mid-arm amputation was performed one inch below an infected skin wound. The flaps looked quite clean at the second stage, and were closed. Mild sepsis broke down about an inch of the skin edges, but the stump was healed after four weeks. The other two cases were both compound fractures of the femur with complications necessitating amputation. Preliminary wound toilet and sulphanilamide dressings had produced very mildly infected wounds. They came to amputation three and five days respectively after wounding. In each instance the first stage was performed through the wounds and fracture, damaged skin and muscle being excised before the introduction of the sulphanilamide and pack. At the second stage the wound appeared to be clean and dry except for minor infection at the corners of the incision, and the flaps were tightly closed except for these areas. The skin edges partly separated, but the wounds did not break down, and the stumps were healed, with linear scars, four to five weeks later.

4. Only 2 cases developed severe established infection with suppuration. In both of these pus was found on removal of the pack at the second stage, and the flaps were left open. In no case did sepsis develop to the extent of breaking down the wound after closure at the second stage of the amputation.

No case in this series came to operation within 24 hours of wounding. But with the introduction of air evacuation many arrived at the base inside two days, and in exactly half the cases reported amputation was performed within the first week, when the danger from lymphatic infection should have been at its height. They are therefore comparable to amputations performed in the forward areas. Of the 13 cases, only one developed severe infection. The three instances of mild superficial infection belong to this group.

The remaining 13 were operated on at intervals varying from one to ten weeks after wounding, again with one failure. Seven were cases in which severe progressive infection had worn down the patient's resistance to breaking-point. Six were reamputations after low guillotine operation in the forward areas. The two-stage method made it possible to perform reamputation successfully very much earlier than would normally have been considered safe, even though the flap incision was often extremely close to the guillotine wound. The following case is an example:

Rfn. S. sustained a gunshot wound in the groin with division of the external iliac artery. Excision of groin wound and ligature of artery were performed and guillotine disarticulation of the knee, in a forward area. Ten days later the guillotine wound was still discharging freely. The groin wound was clean and granulating. (Two-stage amputation with primary healing. Figs. 1, 2, 3.)

Conclusion

The procedures at present in vogue for amputation accept infection of the stump as inevitable. The guillotine seeks to side-track it, the loose-closure method to minimize its effects.

The two-stage operation aims at prevention of infection. In the cases reported it has yielded impressive results. Moreover, should it fail in its object no harm has been done.

The two stages of the procedure fit logically into the average time-lag between forward-area surgery and arrival at a base hospital. It is suggested that under modern conditions there should be no difficulty in giving the method a controlled trial.

REFERENCES

Amer. Med. Ass. (1942). *Handbook on Amputations*, Chicago.
M.R.C. (1941). War Memorandum No. 5, *Emergency Amputations*, H.M. Stationery Office, London.
Verrall, P. J. (1941). *Surgery of Modern Warfare*, ed. by H. Bailey, p. 774, Livingstone, Edinburgh.
Whipple, A. O. (1940). *Ann. Surg.*, **112**, 481.

PASTEURIZATION OF MILK AND INFANT MORTALITY RATES IN TORONTO, VANCOUVER, AND VICTORIA

BY

ALAN BROWN, M.D.

Professor of Paediatrics, University of Toronto

[*In reply to an inquiry from Dr. Donald Paterson, Secretary of the British Paediatric Association, regarding statistics of infant mortality rates and pasteurization in Vancouver and Toronto, Dr. Alan Brown was able to collect through Dr. Bob Defries, Director of the School of Hygiene, University of Toronto, the following information, which he thinks presents the situation very plainly. It is, he says, quite unfair to compare statistics as statistics, because there are so very many factors to bear in mind. "We all know here that the climate is much more favourable on the Pacific coast than it is in the eastern part of the country. And, after all, the great importance of pasteurization lies in its reduction of all milk-borne infections. We have not had a case of milk-borne infection (including bovine tuberculosis) enter the Hospital for Sick Children—having lived in the city of Toronto and used nothing but pasteurized milk—since 1915." The inquiry arose out of a statement on infant mortality in Toronto made by Dr. A. H. Macdonald in a letter to the* JOURNAL *of Jan. 9, 1943.*]

Discussion of pasteurization in the British Parliament was recorded in the *British Medical Journal* in September and December, 1942. In the issue of Dec. 19, 1942 (p. 727), there appeared a leading article entitled "Do Doctors Disagree about Pasteurization?" and several letters were subsequently published from correspondents. The following abstract from a letter from A. H. Macdonald, appearing in the correspondence columns of the *Journal* for Jan. 9, 1943 (p. 52), affords the probable basis of this inquiry from England regarding infant mortality rates and pasteurization in these Canadian cities: "The infant mortality in Toronto, where all milk is pasteurized, is double that in Victoria, Vancouver, where all milk is drunk raw. My own statistics dealing with large masses of children for 18 years show raw milk to be a good thing." (The letter refers to "Victoria, Vancouver." It is possible that the writer meant Victoria on Vancouver Island. As it is not clear, we have dealt with the cities of Victoria and Vancouver.)

Comment

1. The infant mortality rate for the city of Vancouver in 1940 was 25.6; for Victoria, 28.4; for Toronto, 38. The rate in Toronto is approximately one and a half times the Vancouver and Victoria rates.

2. The statement "in Victoria, Vancouver, where all milk is drunk raw," is incorrect, since in the report from the Medical Officer of Health for Vancouver, made to the Committee on Milk of the Canadian Public Health Association, as relating to 1938, the proportion of milk pasteurized in that city was given as 79%; and in a similar report from the Medical Officer of Health for Victoria 50% was stated to be pasteurized.

Discussion

In considering the causes, as recorded statistically, of infant mortality under the headings of (*a*) "Diseases Peculiar to Early Infancy"; (*b*) "Communicable Diseases"; (*c*) "Acute Respiratory Infections"; (*d*) "Diarrhoea and Enteritis"; and (*e*) "All Other Causes," for Toronto and Vancouver, reference will be made to the data for the years 1919, 1929, and 1939. These three 10-year periods indicate the significant changes.

(*a*) *Diseases Peculiar to Early Infancy.*—In 1919 Toronto had a rate of 41.2 for this group of causes, in contrast to Vancouver, which had a rate of 26.3. Ten years later (1929) the Toronto rate had fallen to 37 and the Vancouver rate to 16.3. In 1939 the Toronto rate had fallen to 25.7 and the Vancouver rate to 13.1. The Toronto rate is practically double the Vancouver rate. As this group of causes represents more than half of the total infant mortality it is evident that much of the difference between the rates for Toronto and Vancouver is due to this group of causes, which includes prematurity, etc.

(*b*) *Communicable Diseases.*—The rate in 1919 for this group of causes was 7.4 in Toronto and 5.2 in Vancouver. Ten years later (1929) the Toronto rate fell to 5.7 and the Vancouver rate to 1.6. In 1939 the Toronto rate was 1.5 and the Vancouver rate 0.5. It will be noted that the rate in Toronto is three times the rate in Vancouver; but the total number of deaths from communicable diseases is quite small and does not explain the difference between the gross infant mortality rates.

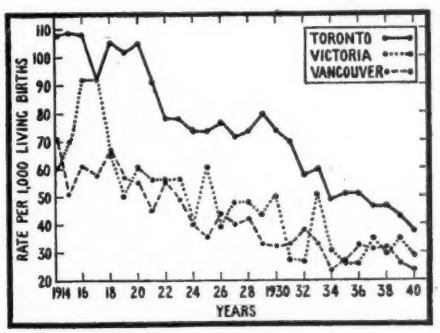
(*c*) *Acute Respiratory Infections.*—In Toronto the rate in 1919 for this group of causes was 16.3, and in Vancouver 7.4. In 1929 the Toronto rate was 6.5 and the Vancouver rate 5.7. In 1939 the Toronto rate was 4.8 and the Vancouver rate 2.1. It will be noted that the Toronto rates are again almost double the Vancouver rates; but the total number of deaths contributed by this group of causes is small and does not represent a major factor in the difference between the two rates.

(*d*) *Diarrhoea and Enteritis.*—In 1919 the Toronto rate was 11.5 and the Vancouver rate 5.2. Ten years later (1929) the rate for Toronto had fallen to 9.7 and for Vancouver to 1.4. In 1939 the rate in Toronto was 2.2 and in Vancouver 0.

(*e*) *All Other Causes.*—In 1919 the rate in Toronto was 25 and in Vancouver 12.6. In 1929 the rate in Toronto was 19.3 and in Vancouver 8.5. In 1939 the rate in Toronto was 9, and the rate in Vancouver also was 9.

From this analysis it is evident that the major differences in the rates in Toronto and Vancouver are accounted for largely by the differences in the rate in the group of causes entitled "Diseases Peculiar to Early Infancy." It is interesting to note that the fall in death rate in the group of diseases to which pasteurization would primarily be related—namely, diarrhoea and enteritis—is now approximately the same in both cities and represents a very small number of deaths.

Reference is not made to the city of Victoria because data of infant mortality rates by groups of causes were not available and, further, because the figures are for Greater Victoria, which includes adjacent municipalities. As, however, the infant mortality rate for Victoria is only slightly higher than that of Vancouver, analysis would probably yield similar data.



Graph showing infant mortality rates in Toronto, Victoria, and Vancouver from 1914 to 1940.

In considering this question of the difference in infant mortality rates of certain cities on the Pacific coast it is of interest to refer to a paper by Bellows and Reed published in 1934 in the *American Journal of Hygiene* (vol. 20, p. 565) entitled, "The Effect of Certain Environmental Factors on Urban Infant Mortality Rates." In this article a table is presented giving the crude infant mortality rates for cities in the United States having a population of over 100,000 and under 1,000,000, corrected for five factors—temperature, latitude, relative number of foreign-born, relative number of coloured, and unemployment in manufacturing and mining. Of the seven cities with the lowest crude infant mortality rate, six were on the Pacific coast, Seattle leading with the rate of 56.6. To each of these a substantial correction was considered necessary, ranging from plus 9 to plus 28. Seattle and Portland, Ore., retained the lead among the first seven; in fact, among the first ten. Others on the coast did not fare so well. "The first ten cities whose crude rates were all below 80 have marked increases in their corrected rates. The group will be seen to include all of the cities located on the northern Pacific coast, where climate is relatively favourable. Allowance for this factor, and for the lack of industrialization in the Pacific cities, was largely responsible for the changes in their rates. Adjustment for the small industrial development was the principal

correction in the other cities in this low mortality group (the first ten), temperature in this case being a factor of minor importance."

This subject was further considered by Dr. L. A. Pequegnat, Deputy Medical Officer of Health, Toronto, who presented a paper entitled "The Present Problem in Infant Mortality" to the Academy of Medicine, Toronto. The paper was published in the *Canadian Public Health Journal* (1938, **29**, 477). It reproduces a table of Bellows and Reed's. In this paper the rates for Toronto and Vancouver are presented for the years 1930 to 1935. In 1930 and 1935 the infant mortality rate in Toronto was double the Vancouver rate. It would seem, therefore, that the lower rates of Vancouver and Victoria require in their consideration some of the factors studied by Bellows and Reed. That climate alone is not the factor is evidenced by the fact that the rate in Calgary in 1940 was 31.2 and in Edmonton 30.6, in comparison with 25.6 in Vancouver and 28.4 in Victoria. Figures for other cities in Canada are: St. John, N.B. (65% of milk pasteurized), infant mortality rate 55 (1940); Montreal (95% pasteurized), rate 70 (1939) and 58 (1940); Three Rivers, Que. (60% pasteurized), rate 97 (1940). In Ontario all municipal milk supplies were required to be pasteurized in 1938. Data for 1940 give the following infant mortality rates: Hamilton 33, London 36, Kitchener 37, Ottawa 49.

From these rates it is evident that neither climate nor pasteurization of milk gives an answer to the differences in rates. The larger number of deaths due to prematurity, etc., is an important factor.

THE OCULAR CRITERIA OF DEFICIENCY OF RIBOFLAVIN

BY

M. K. GREGORY, M.B., Ch.B., D.O.Oxon

Since Bessey and Wolbach (1939) showed that corneal vascularization was a sign of riboflavin deficiency in rats, and since the publication of two papers on ocular manifestations of ariboflavinosis, by Kruse *et al.* (1940) and Sydenstricker *et al.* (1940), there has been a spate of enthusiastic but uncritical investigations. It is therefore necessary that there should be some attempt to clarify the confusion of thought and to correct the looseness of terminology that has arisen. Evidence of this confusion is to be found, for example, in a recent report of an investigation by Scarborough (1942) in which he has taken the sign of circumcorneal injection as being of primary importance. This sign can occur in early ariboflavinosis, but it certainly is not pathognomonic; and I do not find anything in the paper by Sydenstricker *et al.* (1940), which is quoted by Scarborough, to indicate that this isolated sign should be so interpreted. A further discrepancy which I have noted occurs in the two papers mentioned above, which in one place describe the earliest change noted as being a superficial invasion of the cornea by capillaries, and in another place say that "the earliest and most common sign of ariboflavinosis is circumcorneal injection." Also the terms "circumcorneal injection" and "ciliary congestion" are used indiscriminately without indicating whether just some degree of fullness of the superficial pericorneal vessels is meant or whether there is an intense ciliary blush. From my own recent observations and from verbal corroboration by other observers I question whether what is clinically known to ophthalmologists as circumcorneal injection is necessarily an accompaniment of mild early corneal vascularization as we see it in this country.

As the ocular changes in early deficiency of riboflavin are concerned with the vascular supply of the limbus it is essential that observers first should have an exact knowledge of the normal blood supply and arrangement of vessels at the limbus; secondly, they should have an accurate idea of the changes which, in the light of our present knowledge, may be expected to occur; and, thirdly, they should know what other conditions may produce somewhat similar appearances and how these may be distinguished. I propose to give a brief outline of these three points.

Fortunately it is rare at present for nutritional deficiencies to be more than slight in this country, and therefore, as it is the mild rather than the gross changes that are being considered, the picture that we may expect to find will scarcely be comparable with the fully developed cases described by Sydenstricker *et al.* (1940) and Kruse *et al.* (1940). I am not considering such signs as pigment deposits on the iris and mydriasis, as the significance of these has not yet been adequately established.

The Normal Blood Supply of the Limbus

The blood supply of the pericorneal region comes from the anterior ciliary arteries arising indirectly from the ophthalmic arteries via the arteries of the four recti muscles, each tendon being accompanied by two, except the external rectus, which has only one. These arteries pass forward on the episclera, giving branches to the sclera, corneal margin, and conjunctiva. The main branch of each artery pierces the sclera about 4 mm. from the corneal margin to enter the ciliary muscles, where it anastomoses with the long posterior ciliaries to form the circulus iridis major. Before piercing the sclera the anterior ciliary arteries give off the anterior conjunctival branches, which run forward deep to the posterior conjunctival arteries and anastomose to form the pericorneal plexus, consisting of a series of arcades parallel with the corneal margin. These give off final branches, marginal loops which bend round on their tracks to form venules leading into a venous plexus built up on similar lines. The anterior conjunctival arteries also give off small posterior branches to anastomose with the posterior conjunctival arteries, which come from the palpebral branches of the nasal and lacrimal arteries of the lids.

The pericorneal plexus is in two layers—the superficial conjunctival and the deep episcleral. This distinction is important because in superficial affections of the cornea the superficial portion is injected and may rightly be termed circumcorneal injection, whereas in diseases of the iris, ciliary body, or deep part of the cornea the deep episcleral portion becomes congested and gives rise to the rose-pink or violet band typical of ciliary congestion. This deep ciliary congestion is always a serious sign as indicative of uveal disease, but superficial circumcorneal injection can be transiently produced by vigorously rubbing the eye for a moment; and it results from irritations such as exposure to wind, cold, bright light, mild chemical irritants, mild infection, and numerous other causes. From such causes there must be a considerable proportion of the population showing circumcorneal injection, which would fit the description given in the paper by Sydenstricker *et al.* (1940) as "often it was grossly visible, frequently it could be seen with a hand lens or ophthalmoscope, and always it was obvious on slit-lamp inspection as marked congestion and proliferation of the limbic plexus." On this point I would ask what evidence there is that there is any real proliferation and not only engorgement of pre-existing but empty and therefore invisible vessels.

The extent to which the vessels may, within normal limits, extend on to the cornea should also be defined. The limbus is the whole zone in which the sclera and cornea overlap owing to the edge of the cornea being inset like a watchglass in a groove in the sclera. Though it is said to be 1 mm. in width, it is very variable, often being much wider than this. With the slit-lamp the whole width of the limbus appears like ground glass, increasing in opacity peripherally. It may be segmented by digitations or may appear homogeneous. The marginal plexus is described as occupying a triangular area whose apex lies where Bowman's membrane ends and whose base is formed by episcleral and scleral tissue (Wolff, 1940). Thus it is normal for vessels to occupy the whole width of the limbus, and there is not necessarily an avascular zone between the plexus and sclero-corneal junction; and capillaries which do not extend beyond the limbus thus defined are considered to be within the limits of normal.

Ocular Appearances in Riboflavin Deficiency

The chief sign is a superficial invasion of the cornea by very fine capillaries arising from the apices of the marginal loops. These lie just deep to the epithelium and extend evenly as streamer-like vessels which anastomose to form a series of loops from the apices of which more capillaries grow towards the centre, giving the appearance, with the slit-lamp, of fine almost parallel vessels extending on to the cornea round the whole of its periphery in both eyes. The extent of invasion may differ in each eye. Superficial and interstitial opacities develop at various stages, but are definitely later in occurrence than the initial vascularization. In more advanced cases the vessels penetrate to a greater depth into the substantia propria. In a proportion of cases there is some injection of the pericorneal plexus, which in mild deficiency is confined to the superficial conjunctival layer.

Other Causes of Corneal Vascularization

The cause of the most extensive vascularization of the cornea is interstitial keratitis, in which the new vessels invading the cornea come from the anterior ciliary arteries as they pass deeply through the sclera, and thus, as the sclera is opaque, they disappear behind the limbus. With the slit-lamp they are seen to lie in the posterior half of the substantia propria over the whole area of the cornea and are irregular in arrangement, in contradistinction to the superficial centripetal regular arrangement of capillaries in riboflavin deficiency.

Some other conditions in which vascularization of the cornea may occur are vitamin A deficiency, tryptophan deficiency, injury of corneal epithelium due to chemical irritants, diseases causing pannus, such as trachoma, phlyctenular keratitis, pannus degenerativus, and also any superficial keratitis.

Bessey and Wolbach (1939) describe corneal vascularization, similar to that due to lack of riboflavin, in rats deficient in vitamin A ; but this is not usually described as a sign associated with keratomalacia in human subjects, nor have I found it as an early sign in people known to be deficient in vitamin A. Albanese and Buschke (1942) describe vascularization of the cornea similar to ariboflavinosis in cases of tryptophan deficiency in both adult and growing rats and reversible by giving tryptophan. It is unlikely, however, that this specific deficiency will arise without other evidence of deficiency of protein. Vascularization from chemical causes is not usually bilateral nor so regular and uniform, except in the case of exposure to chemical vapour, which can give a comparable picture ; but the history and the somewhat atypical appearance should enable it to be differentiated.

The vascularization of trachomatous pannus is confined to the upper part of the cornea under the upper lid and, as is characteristic of all pannus formation, there is infiltration of granulation tissue and leucocytes between and around the vessels. Phlyctenular pannus may occur right round the periphery, but it is of the pannus type of vascularization with coarser vessels, and can be further distinguished by symptoms of lacrimation, photophobia, irritation, and blepharospasm, which are extreme in this condition. Pannus degenerativus occurs in old blind eyes and starts in the substantia propria.

Out of 1,059 presumably normal people whom I recently examined in search of signs of riboflavin deficiency 31 (3%) showed corneal vascularization compatible with ariboflavinosis, and of these only 14 were recorded as having any injection or even fullness of the limbic plexus. Among these 31 only 5 complained of any subjective symptoms such as burning, irritation, or lacrimation, and none volunteered a history of twilight blindness, which Pock-Steen (1939) asserts is an early sign. In only 4 cases was the visual acuity in both eyes less than 6/6. Eight cases showed other signs of riboflavin deficiency such as glossitis or cheilosis. In all these subjects a full clinical examination was carried out and their night vision was tested. These results will be published at a later date.

I would suggest that, as in the cases examined by Scarborough (1942) the greatest incidence of pericorneal injection occurred in the age group 50–59, this may be a normal finding, since people of this age rarely have the clear white limbus normally found in youth.

Since the 47 patients in Sydenstricker's investigation were being given 300 mg. of nicotinic acid daily it appeared possible that the vasodilator action of this drug might have some influence on the high incidence of circumcorneal injection found. In order to test the possibility of this, I examined the eyes of 6 normal medical students and then administered 200 mg. of nicotinic acid by mouth. When examined 20 to 30 minutes later two showed marked injection of perilimbic plexus, three a moderate degree of injection, and one very little change. These subjects continued to take 200 mg. daily for five days, and were finally examined again 8 hours after taking the last dose. Three showed no increased vasodilatation compared with their original state and three showed a very slight but not significant increase. A further series of 6 subjects were given 200 mg. of nicotinic acid after examination, and then examined at half-hourly intervals. One showed marked, three moderate, and two only slight injection. The two slight and one moderate had returned to normal in 1½ hours, and two moderate and one marked case had returned to normal in 2 hours. Thus it is inferred that the local effect of these doses of nicotinic acid is important only within 2 hours of its administration.

It may be said that I have committed the error that I have criticized in Scarborough's paper in laying the emphasis on one isolated symptom—viz., corneal vascularization. This at least is more justifiable in that it is generally recognized as a more characteristic sign, and, according to Bessey and Wolbach (1939), "it precedes all other demonstrable lesions of the deficiency." Even so, I should refrain from diagnosing a definite deficiency on this single finding in the absence of other signs, such as cheilosis or the typical glossitis, unless it responded to treatment with riboflavin.

I would, however, advocate most strongly that those interested should acquire an accurate picture of the signs indicative of this deficiency, so that large quantities of this expensive vitamin preparation, which will presumably be so valuable in post-war Europe, will not be given empirically or unnecessarily, and considerable time will not be wasted in investigating signs that have no real diagnostic value.

Summary

An attempt has been made to elucidate early ocular signs due to riboflavin deficiency. Previously, circumcorneal injection has been given an unduly prominent place by other workers, whereas corneal vascularization is a more reliable sign. This is of a distinctive type, consisting of fine streamer-like centripetally arranged vessels invading all round the cornea in both eyes.

The normal anatomy of the part of the eye involved has been described, and other pathological conditions which might give comparable appearances have been briefly discussed.

An investigation of the effect of administration of nicotinic acid as a possible cause of circumcorneal injection has been described.

References

Albanese, A. A., and Buschke, W. (1942). *Science*, **95**, 584.
Bessey, O. A., and Wolbach, S. B. (1939). *J. exp. Med.*, **69**, 1.
Kruse, H. D., Sydenstricker, V. P., Sebrell, W. H., and Cleckley, H. M. (1940). *Pub. Hlth. Rep.*, Wash., **55**, 157.
Pock-Steen, P. H. (1939). *Geneesk. Tijdschr. Nederl.-Indië*, **79**, 1986 (quoted by Heiman, M. (1942). *Arch. Ophthal.*, Chicago, **28**, 493).
Scarborough, H. (1942). *British Medical Journal*, **2**, 601.
Sydenstricker, V. P., Sebrell, W. H., Cleckley, H. M., and Kruse, H. D. (1940). *J. Amer. med. Ass.*, **114**, 2437.
Wolff, E. (1940). *Anatomy of the Eye and Orbit*, 2nd ed., London.

In spite of outbreaks of small-pox in surrounding territories, since Feb., 1941, not a single case has been reported within the borders of Southern Rhodesia, yet between 1937 and Feb., 1941, the colony had over 2,600 detected cases of small-pox, almost entirely among natives, though the disease was generally of a mild type. It is worthy of note that a vigorous vaccination campaign has been carried out by the Public Health and Native Departments, as a result of which 400,000 natives (nearly a quarter of the colony's native population) were vaccinated. The Public Health Department now has a trained unit consisting of health inspectors and native vaccinators who systematically ensure effective vaccination. Last year the unit vaccinated 147,000 people. When, in Oct., 1941, small-pox broke out in Francistown, Bechuanaland, a few miles across the Rhodesian border, the unit carried out a vaccination campaign along the border for hundreds of miles and not a single case of small-pox developed on the Rhodesian side.

RUPTURE OF RECTUS ABDOMINIS MUSCLE DURING PREGNANCY

BY

RUFUS C. THOMAS, F.R.C.S.Ed., M.R.C.O.G.

Obstetric Consultant, County Borough of Croydon

Rupture of the rectus abdominis muscle is a very rare complication of pregnancy. Mr. T. J. Shields, librarian of the British Medical Association, to whom I am indebted for looking through the literature, was able to find nine instances, of which seven were recorded in foreign journals, and two—Hobbs (1938) and Ashkar (1939)—were published in this country.

Two Cases in the Literature

The patient described by Hobbs was a 6-para, almost at term, who had had a cough for a month, associated with occasional pain in the left upper abdomen. Following a bout of coughing she had a sudden severe pain in the left side of the abdomen, and was admitted to hospital about twelve hours later in a condition of collapse. She died in less than an hour, before a blood transfusion could be given. Necropsy revealed three pints of blood and clot in the sheath of the left rectus, with one large recent tear in the posterior surface of the muscle at the junction of the lower and middle thirds, and evidence of older tears and haemorrhages in the upper segments. Hobbs concluded that the vessel involved was the deep epigastric artery. The uterus contained a 9½-lb. foetus and some excess of liquor amnii.

Ashkar's patient was an 8-para, five months pregnant. She, too, had had respiratory trouble in the form of acute bronchitis a fortnight previously, but the acute abdominal pain associated with the muscular lesion occurred while she was sweeping the floor. A large blood-clot was removed from the right rectus sheath. A transverse, ragged, and incomplete tear was found in the muscle at the level of the umbilicus. This was sutured, and the patient made an uneventful recovery, the pregnancy proceeding to normal delivery at term.

It will be seen that, except for the difference in the duration of the two pregnancies, there is a close similarity in the train of events in the above patients. Both had coughs for some time before the final rupture of the muscle, though in the second case there was the added exertion of sweeping the floor. The muscle gave way in each patient at the umbilical level, which corresponds with the tendinous intersection between the lower and middle thirds. This is about the level of the lower edge of the posterior portion of the rectus sheath, the semilunar fold of Douglas, over which the deep epigastric artery passes before entering the deep surface of the muscle. The pathology of the muscular rupture seems very similar to that met with in rupture of the quadriceps extensor muscle after slipping off a curb or step.

The Present Case

The case I now record was a 3-para who had attended the Croydon County Borough ante-natal clinic from the ninth week of the present pregnancy. Her previous children had been 9 lb. and 10½ lb., delivery in each instance being spontaneous. She had remained well in the third pregnancy until the 36th week, when she had a cold. Two days later, on March 19, 1937, she went to see her own doctor because of a pain in the right side of the abdomen. He examined her the next day, when the pain had become acute. She was admitted to Mayday Hospital at 10.50 a.m. on March 20.

On examination she was complaining of acute abdominal pain, chiefly on the right side, but the whole of the abdomen was rigid. The pulse rate was 92, and the temperature 97°. She looked pale and somewhat shocked. Palpation of the abdomen showed generalized tenderness, but foetal parts could not be felt, nor could the foetal heart be heard. There was no vaginal bleeding. A catheter specimen of urine showed no albumin. The blood pressure on March 17 was 116/80 mm. Hg. A diagnosis of concealed accidental haemorrhage was made, and in view of her condition the membranes were ruptured under general anaesthesia. About a pint of liquor amnii was let out, and was found to be not blood-stained. The os uteri admitted one finger, and the vertex was presenting. It was not possible to say whether labour had actually started, but a vulsellum forceps was attached to the foetal scalp and a 1 lb. weight applied to stimulate labour. During the next twelve hours her condition became slowly but steadily worse, the pulse rate rising to 140. The abdominal pain was increasing, but there were no signs of labour having begun. In view of the deterioration in the general condition it was decided to empty the uterus by Caesarean section. Under general anaesthesia a right-sided pararectal subumbilical incision was made. On opening the sheath of the right rectus muscle it was found to be full of fresh blood-clot, which extended from the symphysial region right up to the ensiform cartilage, and in the umbilical region had spread over to the area between the peritoneum and the left rectus muscle. The right rectus muscle appeared to be almost completely disorganized. No definite bleeding point could be seen. Nearly two pints of blood-clot was removed from the immediate area around the incision. I was now in some what of a dilemma as to the further procedure. It was certain that labour would start very soon, and if delivery per vaginam were allowed there was considerable risk of the sutured abdominal wall giving way. The uterus was therefore evacuated by a lower-segment Caesarean section. The foetus was dead but not macerated, and I think there can be no doubt that its death was the result of the maternal shock. The uterus and abdominal incisions were closed in the usual way, but a corrugated drain was placed within the sheath of the right rectus muscle from the umbilical region to the supra-pubic end of the incision. Recovery was without further incident, but the clot which had been left in the upper portion of the rectus sheath could be felt as a hard mass for some months after.

The patient had sustained a third-degree perineal laceration during the birth of her first child that had never healed, and she had had practically no anal control for eight years; there was a marked cystocele as well. In March, 1938, she was readmitted, and I did an anterior colporrhaphy and posterior colpoperineorrhaphy with reconstruction of the anal canal, followed a month later by sterilization by excision of both Fallopian tubes. The incision for the latter operation was a left pararectal subumbilical one, and I was therefore not able to see the condition of the right rectus muscle. By palpation it appeared to be very deficient, but no trace of the mass of blood-clot in its upper part could be felt. Some adhesions between the peritoneum and the omentum had to be separated, but the abdominal cavity was otherwise normal. She again made an uneventful recovery, and regained almost perfect anal control. Her joy and gratitude over this result, after nine years of incontinence, were pathetic. Her only complaint after getting up was a feeling of abdominal discomfort, which was relieved by the fitting of an abdominal belt.

Summary and Discussion

A case of rupture of the rectus abdominis muscle during pregnancy is reported. The records of two previous instances of the same condition are referred to, and it will be seen that there is great similarity in the train of symptoms in the three cases. All had had respiratory trouble just before the acute condition occurred; all were multiparae, in whom it is probable that the rectus muscle had been weakened by previous pregnancies, the muscle finally giving way at the weakest point—the tendinous junction between the lower and middle thirds—the rupture being precipitated by sudden abdominal strain. The artery involved was almost certainly the deep epigastric, which passes into the deep surface of the rectus muscle just above the umbilical level.

The condition is rare, and can give rise to difficulties in diagnosis. Hobbs does not state what he thought the probable diagnosis was, but only that the condition of his patient suggested a severe haemorrhage, and she died in less than an hour after admission. In Ashkar's case the preliminary diagnosis was of an ovarian cyst with a twisted pedicle, the diagnosis being based on the sudden acute abdominal pain, the presence of a mass high up in the abdomen, tenderness and muscular rigidity, fever, and leucocytosis. In my case the signs closely simulated those of concealed accidental haemorrhage. Though my decision to empty the uterus was based on a wrong diagnosis, the fact that I acted upon it probably averted a fatal issue.

I have seen one other case of traumatic rupture of the right rectus muscle, which I reported in the *Lancet* in 1933. It occurred in an Indian port labourer, as a result of being pinned between the buffer of a railway truck and a bag of sugar which had been swung by crane from a barge. In this case, also, the rupture occurred at the level of the umbilicus, but the whole abdominal wall was burst open, resulting in the extroversion of several feet of small intestine and the crushing of several coils of adjacent gut. There was in this case singularly little shock and no haemorrhage worth mentioning. He made an uninterrupted recovery after resection of six feet of small gut and resuture of the disrupted abdomen, which was closed without drainage.

The case record is published by courtesy of Dr. Oscar M. Holden, Medical Officer of Health, County Borough of Croydon, to whom my acknowledgments are due.

REFERENCES

Ashkar, P. A. (1939). *Lancet*, **2**, 934.
Hobbs, F. B. (1938). *British Medical Journal*, **1**, 895.

Medical Memoranda

Treatment of Prostatic Carcinoma by Oestradiol and Diethylstilboestrol

The fact that American work on this subject is not widely known in this country leads me to report the following cases.

CASE I

A doctor aged 72 was seen in the spring of 1941. Carcinoma of the prostate was the clinical diagnosis, and this was confirmed by biopsy when Mr. Millin of London performed a perurethral removal of the prostatic "flap" to relieve increasing urinary obstruction. After an initial improvement the patient went gradually downhill with increasing urinary obstruction. *X*-ray examination showed metastases in the lumbar spine, and symptoms suggested metastases elsewhere. From July, 1942, because of general weakness and acute back pain he was only able to get out of bed for short periods, and from Oct., 1942, he was completely confined to bed. By the end of December he was requiring three or four hypodermic injections of morphine gr. 1/3 in 24 hours, micturition was very painful with cramp-like pains, the left thigh was swollen with lymphatic oedema, appetite was non-existent, and his colour was grey. There was no evidence of infection of the urinary tract; the prostate felt per rectum was hard, nodular, and large.

Early in Jan., 1943, treatment by intramuscular injection of oestradiol benzoate was started, tentatively at first, and then, after reading the paper by Kahle, Ogden, and Getzoff (1942), more boldly, 42 mg. (420,000 units) being given in the first 28 days. Improvement in the general condition, appetite, and colour was rapid and dramatic. This was followed more slowly by relief of the urinary symptoms. The back pain disappeared, the morphine was reduced, and the change in three weeks from a grey sufferer to a pink-cheeked man with a good appetite had to be seen to be believed. On examination per rectum the prostate was softer and had decreased in size.

Improvement since that date has continued, and he is now able to walk upstairs and out of doors for short distances. In 80 days he has had 159 mg. of oestradiol benzoate, 5 mg. being given on alternate days. In view of his good condition the dose has now been cut down to 5 mg. twice weekly. The only adverse effects noted were painful nipples and some allergic nasal catarrh; in view of the markedly beneficial results these symptoms were borne with some degree of equanimity.

It must be remembered that this patient is a doctor who, with full knowledge of his disease, at first regarded the treatment with a natural medical scepticism, polite but nevertheless apparent.

CASE II

A retired artist aged 80 was seen in Nov., 1942, with an enormous and very hard prostate. Urinary obstruction was increasing, and was obviously soon due to be complete. As his condition was very poor it was agreed to await developments, and to perform a permanent suprapubic drainage when absolutely necessary.

On Jan. 3, 1943, treatment was started with oestradiol benzoate, 1-mg. doses being given daily. This was followed by complete urinary obstruction, and tied-in catheter drainage was adopted. The injections were stopped. In spite of a clean urine the patient went downhill, and in view of Case I the injections were restarted with larger doses, 5 mg. being given on alternate days. Improvement in general condition, appetite, and colour was rapid and sustained, and in a month he had put on about 1 st. in weight. As catheter drainage was still necessary a permanent suprapubic catheter was inserted under local anaesthesia.

In 71 days he received 135 mg. of oestradiol benzoate. On March 15, 1943, he was changed over on to diethylstilboestrol (Boots), 5 mg. being given on alternate days, and improvement has been maintained. He is now able to walk some distance.

CASE III

This patient, aged 71, was seen on Jan. 15, 1943, with advanced carcinoma of the prostate, marked enlargement of the deep inguinal lymph glands, and lymphatic oedema of the thigh. His symptoms dated back for twelve months, and his weight was under 8 st. His appetite was non-existent.

This case was seen by Mr. Bernard Ward of Birmingham, who immediately performed a partial perurethral resection in order to avoid permanent suprapubic drainage.

On the patient's return home his urinary symptoms had been relieved, but his general condition was still poor and his appetite still absent. On Feb. 19 he was started on diethylstilboestrol (Boots), 5 mg. being injected daily, and 215 mg. being given in 44 days. Improvement was rapid and obvious after 7 days, and is being maintained. Over 1/2 st. in weight has been gained in six weeks. Again appetite, colour, and general condition were the first to respond, but improvement in urinary symptoms and the oedema in the thigh is following. Painful nipples are present in this case.

SUMMARY AND CONCLUSIONS

Three cases of carcinoma of the prostate, all advanced, are reported.

Improvement by treatment with large doses of oestradiol benzoate and diethylstilboestrol was marked and sustained. (My feeling is that the former works better than diethylstilboestrol, but it is much more costly.)

Improvement of secondaries appears to take place with that of the primary growth—Schenken, Burns, and Kahle (1942).

From a limited experience it seems that some form of drainage should precede the starting of this treatment, preferably perurethral diathermy.

The giving of large doses of diethylstilboestrol is theoretically carcinogenic; in advanced cases of carcinoma of the prostate this risk may, I think, be taken.

G. HARVIE DUNCAN, F.R.C.S.

REFERENCES

Kahle, P. J., Ogden, H. D., jun., and Getzoff, P. L. (1942). *J. Urol.*, **48**, 83.
Schenken, J. R., Burns, E. L., and Kahle, P. J. (1942). Ib.d., **48**, 99.

Pseudocyesis Simulated in a Male

The following case of hysteroneurosis may be considered worthy of record on account of the rarity of the condition. A feature of interest was the close association between the patient's clinical symptoms and the initial and final stages of his wife's pregnancy. The case responded to psychotherapeutic treatment.

CASE RECORD

In June, 1942, a soldier aged 27 was admitted to the medical wards of an emergency hospital as a case of "? abdominal tuberculosis." He remained in hospital for 40 days, during which time the abdominal distension which was the only abnormal finding in his case progressively diminished. He was thereafter discharged to his unit, and from this period onwards he remained well and constantly employed at his Service duties. On Feb. 20, 1943, he was again admitted to the medical unit of an emergency hospital with a complaint of abdominal distension and epigastric pain of one week's duration. The history revealed the sudden onset of abdominal pain while on parade, followed by abdominal distension and vertigo. Vomiting quickly ensued, which was associated with the putting on of his tunic belt, and did not occur at other times. The severity of his condition progressively increased until his admission to hospital.

Physical Examination.—He was a well-developed man, displaying considerable abdominal distension. There was an absence of tenderness to palpation, and the distension was uniform throughout, offering resistance to deep palpation. This resistance was most marked over an oval area extending from the umbilicus to the symphysis pubis in the middle line and measuring about 5 in. in breadth at its widest point. The circumference of the abdomen was 41 in. at the mid-umbilical level. There was an absence of any localized rigidity or dough-like feeling of the abdomen. With the exception of the physical signs of anxiety, which were pronounced, nothing of clinical interest was elicited on physical examination. Radiography revealed negative findings; test-meal curves were within normal limits; tests for occult blood were negative; and examination of the various systems failed to disclose any abnormalities. On March 3 the abdominal distension was still present to the same degree as on his admission to hospital.

Psychological Examination.—There was well-marked anxiety present. He was morbidly introspective, reticent, and monosyllabic. It appeared that his wife was shortly to be confined and that he had made attempts to secure compassionate leave on account of this. It was significant that when he first learned of his wife's pregnancy in June, 1942, symptoms similar to those on account of which he had been admitted to hospital ensued. On Feb. 13 he had received a letter from home at 8 a.m., and his abdominal distension resulted at 11 a.m. on the same day. Temperamentally he was of a nervous, highly strung, and emotional type, and had previously displayed a deep interest in religious affairs.

In view of the symptoms presented, the diagnosis of hysteroneurosis was made and it was decided to initiate treatment by "reinforced" suggestion. On March 3 12 c.cm. of a 1.5% solution of pentothal sodium was administered intravenously and an explanation of the causative mechanism underlying his condition was given to him. While in the narco-analytical state suggestion was carried out. The abdominal distension slowly subsided and at the mid-umbilical level was reduced to 30 in. The reduction was maintained at this level for a period of one hour subsequent to treatment, and thereafter slowly returned to the former level. On the following day suggestion was given with the patient in the waking state, when the distension again subsided. On March 15 the distension had entirely disappeared; there was complete freedom from pain on deep pressure, and he was able to be employed on light ward duties. On April 15 he was discharged to his unit with a recommendation for a lowering of his category. Leave was granted in order to enable him to visit his wife, and he had volunteered the statement that he now felt better in health than he had done for the past ten months.

I wish to express my indebtedness to Dr. J. Norman Cruickshank for his original recognition of the underlying causative factors, for his co-operation in granting facilities for the examination and treatment of this case, and for his permission to publish the results.

WILLIAM BLYTH, M.D., D.P.M., F.R.F.P.S.G.,
Psychiatrist, Emergency Medical Service.

Reviews

SEA DISEASES

Sea Diseases. The Story of a Great Natural Experiment in Preventive Medicine in the Royal Navy. By R. S. Allison, M.D., F.R.C.P. (Pp. 218. 25s.) London: John Bale Medical Publications.

R. L. S. wrote: "But the sea is our approach and bulwark; it has been the scene of our greatest triumphs and dangers; and we are accustomed in lyrical moments to claim it as our own. The prostrating experiences of foreigners between Calais and Dover have always an agreeable side to English prepossessions. A man from Bedfordshire, who does not know one end of the ship from the other until she begins to move, swaggers among such persons with a sense of hereditary nautical experience." Yet the self-examination of most of us would probably reveal that *Roderick Random*, the novels of Marryat, and a few witticisms of Dr. Samuel Johnson contain all we know of life in the Navy of our ancestors.

Forty-eight years ago the reviewer was presented by his form master with Commander Charles Robinson's *The British Fleet*. It was a good prize for a boy because it contained many attractive pictures, but, consulted in later years, when the reader's interest in medicine had developed, the book was less satisfactory; its 560 pages include two brief references to sickness, a few pages, mainly abstracted from Smollett, on the experiences of surgeons' mates, and some particulars of the uniforms of medical officers. No generally readable work on the medical and epidemiological side of life in the Navy had appeared until now; Dr. R. S. Allison's book, while not too technical to be good reading for a sixth-form boy, will deeply interest a clinician or epidemiologist. It richly deserves Surg. Vice-Adml. Sir Sheldon Dudley's characterization as a "scholarly and fascinating story of the sea."

Killing sea diseases in order of importance numerically have been scurvy, typhus, malaria, yellow fever, tuberculosis. The second and last of these were of equal or greater importance to English landsmen in old days. Now tuberculosis alone is a redoubtable foe of seamen. Dr. Allison shows that scurvy, certainly, and typhus, probably, were not characteristically sea diseases at all before the 16th century, because the technique of shipbuilding and navigation had not reached a standard permitting a ship to remain continuously at sea for months. This is, of course, a conclusive explanation of the absence of scurvy. Whether the closely packed slaves in the old galleys died of fevers or of what fevers they died we do not know. With the coming of ships able to keep the seas for long periods scurvy became a reigning plague, and so long ago as 1601 a sea captain—James Lancaster—demonstrated the value of lemon juice. The story of the conquest of ship scurvy, of the inertia, individual and official, which had to be overcome, has often been told but never better than by Dr. Allison.

The changes in shipbuilding which provided a terrain for scurvy also favoured typhus; there was less ventilation and more overcrowding on board. The British system of impressment for the Navy was epidemiologically a perfect vicious circle. The poorest and dirtiest of the population were brought into the ships and, to prevent desertion, kept on board. Typhus continued to be a sea disease almost down to a time covered by the lives of men still living. Recruitment of volunteers, a general higher standard of cleanliness within and without the Service, extension of the age-long naval demand for order from guns, decks, and rigging to the bodies and clothing of the crew, eradicated typhus.

Dr. Allison has not only given us an epidemiological history; he has told us how the Naval Medical Service grew from a mob of despised underlings, whose status and characteristics were not exaggerated out of *all* resemblance by Smollett, into the efficient and honourable corps we know. He has given us vivid accounts of the careers of the men—Lind, Trotter, Blane, and others—to whom we owe great reforms. Dr. Allison quotes some of the earlier vital statistics of the Navy, particularly those of Blane; it may interest the reader to supplement these with data collected by W. B. Hodge and published in the *Journal of the Statistical Society* nearly 90 years ago (Sept., 1855). Hodge, using Blane's data, estimated the mortality rate from "diseases and ordinary accidents" in the Navy in the war years 1810-12 as 38.3 per 1,000 of strength. In the peacetime Navy of 1830-6 the death rate from all causes was 13.8 and from diseases 11.8 (the rates for 1936 were 2.0 from all causes, 1.4 from diseases alone). He concluded that the wartime surcharge was not less than 16.0. He estimated the whole cost of life of the great war 1793-1815 to the Navy to be about 63,000 lives lost, of which 44,662 were due to excess mortality from disease. The estimated loss of lives from *all* causes in the Navy and Mercantile Marine in 1914-18 was 48,000. These figures illustrate the enormous hygienic improvement which has been effected. If it be objected that the modern war lasted four and the old war more than twenty years, we must remember that the average seafaring population at risk in 1914-18 was far greater than in 1793-1815.

Dr. Allison has done a national service. There is room for a good deal more research into naval vital statistics, but he has provided an epidemiological–sociological foundation for his successors.

SYMPTOMATOLOGY OF CEREBRAL DISEASE

After-Effects of Brain Injuries in War: Their Evaluation and Treatment. The Application of Psychologic Methods in the Clinic. By Kurt Goldstein, M.D. Foreword by D. Denny-Brown, M.D. (Pp. 244. 21s.) London: William Heinemann. 1943.

Among those interested in the symptomatology of cerebral disease the name of Dr. Kurt Goldstein is well known. There can be hardly any contemporary publication on the subject with no reference to his work, and his terms "catastrophic reaction" and "abstract and concrete behaviour" have become stock phrases in the neurological slang. Most of Goldstein's work published during or after the last war is now difficult to obtain, and every worker interested in the subject will welcome this concise monograph, which gives his own version (often misquoted by others) of his experiences and the theories he based on them.

Goldstein's fundamental merit was the introduction into clinical practice of modern (*Gestalt-*) psychological methods, and accordingly the chapters on the basic approach, the origin of symptoms, the psychological laboratory investigations, and the (psychological) treatment of aphasics and of patients with circumscribed cerebral defects are the most stimulating and the most valuable parts of the book. In the chapters on general and neurological symptomatology one realizes too often that the development of neurosurgery and of some auxiliary medical sciences has made much of the experience of the last war obsolete. Ventriculogram and EEG are not mentioned; methods of studying the autonomic disturbances are not up to date. The psychological part also shows some disappointing omissions, apparently due to the fact that the author keeps too closely to his earlier (1919) book. Very little is said about controls or standardization of the psychological tests used, and, more disappointing, the sorting tests with which the author's name is closely linked do not appear at all in the chapter on laboratory investigations, and are dealt with elsewhere only in a short paragraph and a reference to another publication.

DERMATOLOGY AND SYPHILOLOGY

The 1942 Year Book of Dermatology and Syphilology. Edited by Fred Wise, M.D., and Marion B. Sulzberger. (Pp. 664; illustrated.) Chicago: The Year Book Publishers.

This is the second number of the *Year Book of Dermatology and Syphilology* to be published since the war came to America, and as might well be expected the imprint of war conditions on this excellent summary of the twelve months' work reviewed is very apparent. The editors point out that in the actions of modern warfare no less than 60% of all casualties are often of the nature of burns, and consequently they devote an introductory article of some twenty pages to the treatment of burns, in which all the most modern methods are described and compared. The editors remain strongly in favour of tannic acid preparations, while excluding their use from those situations where their employment may lead to contractile scarring, disfigurement, and loss of function—i.e., on the face, hands, feet, genitalia, etc. They do, however, also commend the saline and sodium bicarbonate methods in certain circumstances and also the application of vaseline tulle gras. This chapter is too long to summarize here, but will

repay careful reading. Perhaps it is also owing to war conditions that the sociological aspects of syphilology are given much prominence in this volume. It may be news to many people in this country to learn that no fewer than thirty States of the U.S.A. require certificates of medical examination, chiefly aiming at preventing the spread of syphilis through marriage, before marriage licences may be issued. Most of them require a blood test. The control of venereal disease in the armed Forces of the U.S.A. has been a subject of considerable discussion, and the conclusion seems to emerge that the most important factor in reducing the incidence of venereal disease among the mobilized Forces is the abolition of commercialized prostitution by closing the houses of ill fame in the vicinity of military and naval centres.

In addition to these matters of topical interest the yearbook includes its usual abstracts of the more arresting publications of dermatological writers during the period under review, often accompanied by shrewd comments from the editors. It may again confidently be recommended to the attention of all occupied with the various manifestations of cutaneous disease.

Notes on Books

A medical man who veils his identity under the pen name DAVID BRUCE has set out some ideas for economic and social reform in a booklet entitled *The Future and the Fighting Generation* (W. H. Allen & Co.; 1s. 6d.). He is appalled at the present system of government which in face of the gravest danger in our history took no measures of defence until it was too late. "To-day we are a nation with a purpose . . . we do not need the regimentation necessary to combat the apathy in national affairs which is all-pervading in our peacetime social circles . . . is the new spirit in the land to survive?" "No more dangerous element is present in our midst than the win-the-war-first-and-then-we-can-think attitude. . . . Political history of the past twenty years is a sorry tale of government without principles—it was government by expedients." From these brief quotations it will be gathered that the author has positive views and feelings. His aim is to secure a better social order to-morrow by setting ideas in motion while people's minds are plastic to-day. To free the House of Commons from "the good party man" and "the tied M.P." he calls for a secret ballot in all major divisions, as the first step to a new and better and safer Britain. Many who agree that the key fault in our Parliamentary system is the power of the central offices of the parties, which reduces M.P.s to mere ciphers, will not go all the way with the author in other directions.

DR. BEEBE'S study of *Contraception and Fertility in the Southern Appalachians* is a statistically competent account of observations made on the use of contraceptives and the inferences which may be drawn as to their effect in limiting fertility. The data also throw some light upon the normal physiology and psychology of sexual union. There is, of course, a large "literature" of the subject; the writings of the late Raymond Pearl are well known, and this volume does not perhaps appreciably modify the conclusions to be drawn from his researches. The English reader who is not a connoisseur of statistical methods will probably find the first chapter, which describes the social-economic situation in the West Virginian coal fields, the most interesting. It is a grim story which should help both to make our judgment of current industrial troubles in the United States charitable, and, possibly, to convince us that our own industrial system does not lag behind that of our kinsmen. The book is published in this country by Baillière, Tindall and Cox at 14s.

A sixpenny pamphlet *The Beveridge Plan: A Symposium* is published by the Individualist Bookshop, Ltd., 154, Fleet Street, E.C.4. The longest of the three contributions is from the pen of Mr. James W. Nisbet, Reader in Political Economy at St. Andrews University, who appraises the plan under the general heading "Britain and Social Security," and criticizes some of its features in sober language, ending with the moral: "If all difficulties are removed, strength of character is undermined." Sir Arnold Gridley follows with a brief essay headed "Deceiving the People," and Sir Ernest Benn winds up with a discussion on some implications of the Beveridge Report, reprinted from the *Quarterly Review*. Both are hostile in the main. Sir Arnold is chiefly concerned to rebuke Press, Platform, Parliament, and Pulpit alike for misleading the Public. Sir Ernest concludes: "If a single sentence can sum up so vast a subject and such an overwhelming quantity of statistics and detail, it may be said that the Beveridge Report may extend the Social Services a little, but will certainly expand the powers of the bureaucracy a lot."

Preparations and Appliances

PLASTER-OF-PARIS WRIST SPLINTS
A Simple Technique for Reinforcement

Capt. I. H. BAUM, R.A.M.C., writes:

A medical officer attached to a general hospital often has to apply plaster-of-Paris splints to the forearm and wrist. From my own experience I believe that the simple dorsal plaster slab technique can be improved. The dorsal forearm slab as applied in most clinics, and a suggested modification, are described and contrasted in this note.

Customary Method of Application.—A roll of 4-in. P.O.P. bandage is made into a slab reaching from the knuckles to about 2 in. below the olecranon, extra layers of bandage being applied at the wrist region to provide increased stability at the joint. The hand is fully clenched to give optimum position at the wrist-joint The slab is moulded to the back of the forearm, which is prone on a table at shoulder height. The disadvantages of this type of splint are: (1) The dorsiflexion at the wrist-joint causes transverse folds and wrinkles to appear in the plaster at this level, especially on the inner surface apposed to the skin. These wrinkles reduce the mechanical efficiency of the tubular plaster and increase its liability to crack. The ridges may cause soreness of the skin and prevent a smooth neat appearance of the finished plaster (Fig. 1).

FIG. 1.—Drawn from a discarded plaster. (Usual method.)

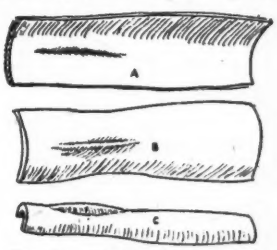


FIG. 2.—A, inside view; B, outside view; C, lateral view.

(2) The rough edges are unsightly and tend to fray or cut into the skin of the elbow.

Suggested Modification.—It is probable that the following technique is not new to many surgeons, but I have been unable to find references or advice as to this being the case. The dorsal slab is made as before, and the edges are "massaged" with the finger-tips to give squareness and to obviate fraying when dry. The plaster is reversed once on the table to ensure smoothness of both surfaces. The slab is then applied to the forearm and wrist. That part of the plaster over the centre of the carpus is pinched into a ridge 1/2 in. high and about 4 in. long, tapering proximally and distally. The rest of the plaster is then moulded in the usual manner (Fig. 2).

The advantages of this modification are: (1) The reinforcement against cracking: weight for weight, it is more efficient than the unmodified P.O.P. (2) The smoother and more closely applied inner surface. (3) The improved appearance.

Further modifications are as follows: First, after the first dorsal slab is applied a second slab is made, 5 in. by 4 in. by 1/4 in. (Fig. 3, A). One-fifth of the width is folded over at each edge (Fig. 3, B), and the groove thus formed is dovetailed on to the ridge of the first plaster (Fig. 3, C). This reinforced form of the slab may be used as a wrist support to enable a worker in heavy industry to carry on full duty with a weakened wrist-joint. The support can be removed when off duty. Secondly, *for fixation of thumb* by a detachable plaster a 6-in. bandage is made into a slab of required length. A longitudinal cut 2½ in. long is made in line with the radial border of the second metacarpal. The radial part of the slab is fitted against the extended and abducted thumb, and two ridges are pinched up and moulded. The main ridge is over the mid-carpus, and the secondary ridge is at the angle of the thumb support (Fig. 4). This technique of buttressing an angled plaster will be found useful in the manufacture of casts at the ankle-joint. An anterior slab of this type applied to the instep serves two purposes: first, it prevents cracking; secondly, it provides a method of rapid removal of the plaster, since plaster shears are more easily inserted at the pleat.

FIG. 3.—Reinforced slab used as a wrist support.

FIG. 4.—Detachable plaster for fixation of thumb.

I wish to express my thanks to Col. D. C. Scott for permission to publish this article.

THE F.R.C.S.

A CENTENARY CELEBRATION

A distinguished company, which included the Princess Royal, Ambassadors of the Allied nations, members of the Government, and High Commissioners of the Dominions and India, assembled in the Great Hall of Lincoln's Inn on July 21 to celebrate the centenary of the foundation of the F.R.C.S., at a reception given by the President and Council of the College. This coveted surgical diploma was instituted by Royal Charter 100 years ago, owing mainly to the efforts of Sir Benjamin Collins Brodie, then Vice-President of the College. It is pleasing to record that at the ceremony last week among those present was Sir Benjamin Collins Brodie, the fourth holder of the baronetcy created in 1834. Brodie, who became President of the Royal Society as well as of the College of Surgeons, described the object of the Fellowship in these words: "To insure the introduction into the profession of a number of young men who may be qualified to maintain its scientific character, and will be fully equal to its higher duties as hospital surgeons, teachers, and improvers of physiological, pathological, and surgical science afterwards."

A Message from the King

Sir ALFRED WEBB-JOHNSON read aloud the following message from the King: "As Visitor of the Royal College of Surgeons of England I wish to congratulate the President, Vice-Presidents, Council, and Fellows of the College on the occasion of the celebration of the centenary of the Fellowship. It has given me great satisfaction to learn that the Council has decided to mark it by conferring the Honorary Fellowship on several distinguished surgeons from the Dominions and Allied countries. I send my best wishes for the continued prosperity of the College, and trust that the plans for the restoration of its unique museum will be successfully carried out as soon as possible after the war." In his reply the President stated: "Your Majesty's interest and good wishes will be a great encouragement to all the Fellows of the College in the heavy tasks which lie before them. They wish to assure your Majesty that they will be untiring in their efforts to restore their museum, towards which they have received most generous promises of help from all parts of the Empire."

The Presidential Address

Beginning his address by welcoming the Princess Royal and other distinguished guests, the President went on to say that even in the crisis of battle it was well to pause and dwell for a moment on our splendid heritage: "The past is always with us, never to be forgotten; and in the continual remembrance of a glorious past we find our noblest inspirations." The amenities of the College, he observed, had been destroyed by the enemy. They were therefore deeply grateful to the Treasurer and Masters of the Bench of the Honourable Society of Lincoln's Inn for putting their hall at their disposal that evening. There was much in common between the College and the Inn. Their Tudor gateway bore the arms of Henry VIII; the College had its Holbein masterpiece to remind them that Henry VIII gave them authority to take a historic step in their corporate progress. Inigo Jones had designed the chapel of the Inn and also the College's Theatre of Anatomy, now destroyed. A hundred years ago the Hall had been built and the Fellowship of the Royal College of Surgeons instituted. G. F. Watts had painted the portrait of Brodie and also the fresco adorning the Hall.

Makers of Surgical History

"'Let us now praise famous men, and our fathers that begat us. There be of them, that have left a name behind them, that their praises might be reported.' Of such were John of Arderne and Thomas Morstede. Of such were Wiseman and Vicary; Ranby and Cheselden. Of such were Pott, Abernethy, Astley Cooper, Charles Bell, Hilton, Paget, and others. Of such, towering above all, were John Hunter, the founder of scientific surgery, and the immortal Lister. Of such also was Benjamin Collins Brodie, who founded the Fellowship of our College." After this gracious tribute to makers of surgical history Sir Alfred Webb-Johnson concluded his notable address by stating that the College wished to mark the occasion by the award of some Honorary Fellowships, the numbers of which on the Roll at one time must not exceed 50. They had chosen for distinction in this way several surgeons from the Dominions and Allied countries. They had not forgotten those in the power of the enemy, but for the present their names must be withheld. "In accordance with precedent we have chosen some who are not practising surgeons, one of them being Madame Chiang Kai-Shek, in recognition of her services to humanity. It is with special pride that we add to our Roll the name of our great Prime Minister, the Right Honourable Winston Spencer-Churchill. I venture to assert that when the history of our times comes to be written Winston Churchill will be judged worthy of the same tribute as that paid to the greatest of our Fellows by the American Ambassador, Mr. Bayard, who, when addressing Lister, said: 'It is not a profession, it is not a nation, it is humanity itself which, with uncovered head, salutes you.'"

The Honorary Fellows

The awards which could be announced were: Sir High Devine, of Melbourne; Sir Thomas Dunhill, Serjeant-Surgeon to the King; Sir Humphry Rolleston, formerly Chairman of the Imperial Cancer Research Fund; Prof. A. T. A. Jurasz, of Poland; the Rt. Hon. Sir Earle Page; Prof. Nikolai N. Burdenko, Chief Surgeon to the Soviet Army; Prof. S. S. Yudin, of Moscow; Col. Elliot C. Cutler, of Harvard University; Prof. W. G. Penfield, of McGill University; Prof. Evarts A Graham, of St. Louis; Prof. R. B. Osgood, of Harvard; Prof. N. S. Shenstone, of Toronto; Prof. Naguib Mahfouz Pasha, of Cairo; Prof. Innes Wares Brebner, of Witwatersrand University.

Those admitted as Honorary Fellows on July 21 were: Col. J. M. Holst, Consulting Surgeon to the Norwegian Army (presented by Mr. H. S. Souttar, Vice-President of the R.C.S.); Mr. Henry Wade, of Edinburgh (presented by Sir Girling Ball, Vice-President of the R.C.S.); Col. J. A. MacFarlane, Consulting Surgeon to the Canadian Army (presented by Major-Gen. C. Max Page, Member of Council); Prof. H. C. Naffziger, of San Francisco, Chairman of Committee on Neurological Surgery of the National Research Council of America (presented by Surg. Rear-Adml. Cecil Wakeley, Member of Council).

Two Russian Surgeons

It will be remembered (see *Journal* of June 5, p. 701) that under the auspices of the Medical Research Council and the British Council a group of British surgeons have gone to the U.S.S.R. on a joint Anglo-American Surgical Mission. During this visit Surg. Rear-Adml. G. Gordon-Taylor, as Senior Vice-President of the College, has admitted to its Honorary Fellowship the two Russian surgeons, Dr. Nikolai N. Burdenko, Director of the Operative Surgery Institute, Moscow University, and Surgeon-in-Chief to the Red Army, and Dr. Sergei S. Yudin of the Sklifassovski Hospital for Traumatic Diseases, Moscow. In admitting Dr. Burdenko, Admiral Gordon-Taylor said that in the years gone by the Fellowship had been presented three times to Russian surgeons—Victor Pachoutine, Nicolas Weliaminoff, and Vladimir Andrejevic Oppel. "We respect you, Academician Burdenko," he continued, "former pupil of the illustrious physiologist, Pavlov; we admire you as a great scientific surgeon and brilliant contributor to the advance of neurological surgery, but we honour you now as Surgeon-in-Chief to the famous Red Army, which has fought with a bravery and distinction that has commanded the wonder and admiration of all."

In conferring the Honorary Fellowship on Prof. Yudin, Admiral Gordon-Taylor said that they honoured him not only as a famous Soviet surgeon but also for what he had done by his publications to ensure that the contributions of Soviet workers towards the advancement of surgery should be known throughout the world. "The orbit of your surgical activity," he added, "has been vast and varied; you have made notable contributions to gastric surgery and have modified its technique; your writings on gastro-duodenal haemorrhage demand the closest attention and are of particular interest to myself, who have worked in the same branch of surgery; the numbers of patients suffering from cataclysmic haemorrhage whose lives have been preserved by your methods and your skill are impressive and convincing."

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY JULY 31 1943

FACT AND FANCY IN POLIOMYELITIS

In no field of neuropathology has advance been more rapid than in the case of poliomyelitis, and the successive additions to our knowledge within the past few years have necessarily involved the abandonment or modification of earlier views on such subjects as the portal of entry of the virus, the site and nature of the essential lesion, and the bases of the characteristic clinical variants of the malady. These advances have been pursued with great eagerness, and it cannot be said that those interested in the many problems surrounding poliomyelitis have been unreceptive to fresh ideas. Anything that offers to increase our control over so grave and disabling a disease may be sure of the most careful and favourable consideration. Yet it is in the realm of treatment that it is always most difficult to secure the dispassionate assessment of results that is so essential to rational therapy, and it is fair to say that already the ideas and methods associated with the name of Sister Elizabeth Kenny have become matter of animated controversy. This controversy has now reached a further stage in the publication by an American orthopaedic surgeon in collaboration with Sister Kenny of a considerable volume[1] on the new concept of poliomyelitis formulated by the latter and on the methods of treatment she advocates. The book has no fewer than three forewords and a final commentary by other writers, and, even though we miss from this impressive list of names those most familiar to us among the brilliant band of American workers on poliomyelitis, it is apparent that Sister Kenny does not lack sponsors in their country. From Sister Kenny's foreword it appears that as a result of her thirty years' work as a nurse dealing with cases of poliomyelitis she early became impressed by the presence and great importance of painful spasm of muscles in cases of poliomyelitis, and by the need for measures to relieve it at the earliest possible moment. She developed her own technique of treatment, including the local application of heat and remedial exercises, and the latest improvements on these are fully described in the book. There can be no doubt that Sister Kenny brought to her work unusual energy and thoughtfulness, and we may well believe that the young patients who came under her skilful hands received a thoroughness of treatment that, in the Australian bush where Sister Kenny tells us she began her work and developed her theories, was unprecedented and gave results as gratifying to her patients and their parents as they were encouraging to herself. Doubtless many of these children have reason to be grateful to her; nevertheless it is permissible to regret that Sister Kenny was not content to remain an outstanding practitioner of her particular art, and that she has succumbed to the temptation to rationalize her methods by providing a scientific basis for them. For this difficult—and quite different—task she had not the necessary training in physiology and pathology. However, she has formulated what is described as an entirely new concept of the disease which Dr. Pohl, the principal author of the book, says "almost warrants considering the entity a new disease," whatever this may mean. But it is clear that, whatever measures of practical benefit may follow from the use of Sister Kenny's methods, her "entirely new concept" must stand or fall on its merits as a necessary and adequate generalization of the facts, though not necessarily as these are stated by her. Her methods may well be useful but her concept erroneous. The allowances we may be disposed to make for her presentation of her concept, in view of the difficulties arising from the fact that Sister Kenny has no medical training, do not relieve us from the obligation of assessing this by the proper standards applicable to all medical theories; and that Dr. Pohl sponsors the concept makes it the more necessary to scrutinize it critically, in view of his experience as an orthopaedic surgeon.

Briefly, Sister Kenny's case is that we have all been in error in supposing that destruction of ventral horn cells in poliomyelitis plays a significant part in the production of the characteristic paralyses and disabilities of this disease, for in truth this lesion is only a minor consideration in most cases. In short, the morbid anatomy of the disease, as we know it, is largely irrelevant. Further, we have omitted to pay attention to the painful muscular spasm which for her is the most prominent and the most important feature of the illness, and in consequence we have adopted principles of treatment that are adverse to optimum recovery. According to her new concept the "primary lesion" of the disease—as Dr. Pohl has it, but as we may correctly name it, the essential clinical feature—is muscle spasm. This is not merely a transient initial phenomenon, but persists indefinitely unless treated and leads to wasting, weakness, and contracture of the affected muscles with resulting deformities. Secondary to this spasm is a condition of "mental alienation" in the muscles antagonistic to those in spasm. This shows itself as a flaccid powerlessness with loss of tendon jerks. It persists as long as does the spasm, and like this leads in the end to wasting, permanent paralysis, and contracture. Further, there are marked incoordination of muscle movements, and, last and least, some small degree and extent of true paralysis due to destruction of ventral horn cells. Fortunately, says Dr. Pohl with an optimism few will feel able to share, this last item is rarely of any importance.

We may leave for the moment the question whether this statement correctly represents the facts of poliomyelitis clinically considered, and pass on to discuss the details provided as to the cause and nature of spasm, mental alienation, and incoordination, all of which features, we are told, have hitherto escaped the notice of clinicians. But it is when we come to grips with the new concept that our troubles begin, for the authors have not succeeded in achieving agreement on any of the fundamental points, and at times we are hard put to it to decide which to choose of the various speculations put forward. Thus, according to Dr. Pohl, the cause of the spasm is (*a*) unknown, (*b*) irritation of motor nerve cells in the cord, (*c*) a direct action of the virus on the muscle fibre or on the myoneural junction, or (*d*) anoxia of the muscle. Dr. Knapp in his terminal commentary suggests toxic changes in the muscle, anoxia of the muscle, or irritative cord lesions. Since no evidence is forthcoming for any of these hypotheses, it is remarkable that all the contributors to the volume are agreed that the known changes in the ventral horn cells are certainly not responsible. The quality of the spasm provides its own difficulties, for, although it

[1] *The Kenny Concept of Infantile Paralysis and its Treatment.* Saint Paul, Minneapolis, U.S.A.: Bruce Publishing Company. 1943.

leads to shortening of the muscles and to their hypertonicity, it does not cause any exaggerated tonus in them.

Mental alienation provides yet more difficult matter of exegesis. For Sister Kenny it can be described only in terms of psychology—the mind is divorced from, and becomes unaware of, the alienated muscle—but for Dr. Pohl it is a matter of "physiological block in the motor pathway." In fact, the authors trip lightly from psychology to physiology, from mind to matter, with an ease and an assurance a philosopher might envy, and with a naïve unconsciousness that they are doing anything remarkable. The alienated muscle is flaccid and inactive, and hangs between its points of insertion like a hammock, but yet differs from the truly paralysed muscle by the slight tonus it possesses. The muscle is normal, and is powerless only because the spasm in its antagonist renders it so; its structure and innervation are alike intact. According to Sister Kenny it is powerless "through some disorganization" which causes "an interruption of the normal flow of impulses and the patient cannot visualize in space the exact area from which an attempt to contract should materialize, and the impulses run riot, as it were." Yet, "remembering that consciousness is born of the subconscious, I endeavoured to bring consciousness about by attempting to bombard this area with impulses from the surrounding muscles . . . I would attempt to restore the reflexes to the tendon of the alienated muscle," using for this purpose a form of vibratory massage that, as she believed, restored what she calls "the brain path." Turning to Dr. Pohl for light upon this passage, we learn that "alienated muscles are examples of a physiological block in the motor pathway. They have merely ceased to function and become temporarily dissociated from the nervous system by the action of disease and in some instances as a direct result of spasm of the opposing muscles. Even the tendon reflexes of such muscles disappear and the alienated muscle has the appearance of being paralysed." For alienation, as for spasm, we are offered a wealth of explanations. They include reflex inhibition by antagonists in spasm, the action of the virus on the muscle, and also the confession that the cause is unknown. Dr. Knapp assumes the predominance of psychological factors, and finds in the fact that spasm precedes alienation a good reason for adopting this explanation.

The incoordination of muscle movement is attributed to "a condition in the central nervous system in which the regulation and direction of nerve impulses is upset so that the natural rhythmic and co-operative action of associated muscles is disturbed. The muscles concerned are otherwise normal, but the misdirection of nerve impulses makes muscular activity incoordinate and ineffective. The process is in no way concerned with the will or volition of the patient but is rather a disorganization of the regulating centres and nerve pathways directly attributable to the disease process itself." These long pronouncements may be summed up by saying that alienation and incoordination are due to the disease process. They are triumphs of the *circulus in probando*, and seldom can so little have been said in so many words as these authors employ. It would be without profit to pursue this concept further. Discarding the known pathology of the disease, it offers no more than vague statements to the effect that the essential disorder is a "disruption and disorganization of the nerve cell connexions and synaptic relationships which might persist in spite of the survival or recovery of the cells themselves"—a speculation which hardly accords with the claim that Sister Kenny's methods of treatment secure recovery in 80% of cases.

As to the facts, that some muscle spasm is an initial symptom of poliomyelitis has long been familiar, and has indeed been the basis of diagnostic clinical tests, but that it persists indefinitely unless specifically treated by hot packs and of itself leads to permanent wasting, weakness, and deformity is not the general experience. That some muscles are more painful to pressure than others is also not a new discovery, and the association of flaccid and complete paralysis of muscles with painlessness is also known. Indeed, what is characteristic is that muscles which are but relatively slightly paralysed are the most painful and tender. The statement that flaccid inactive muscles are not really paralysed, but are only alienated and lost to voluntary control, is a purely verbal distinction that lacks a corresponding reality. Indeed, the entire physiology and pathology of Sister Kenny's "new concept" uses the terminology, but does not speak the language, of science, and finds its only current parallel in the medicine of Mrs. Baker Eddy's world-famous publication, *Science and Health*.

Yet there is perhaps a little more to be said on the matter, and this from what we may surmise is Sister Kenny's own point of view. The problem of pain and tenderness in the affected muscles of poliomyelitis is one that has never been faced. It calls for some explanation, but none has ever been seriously attempted. The same is true of the tenderness of muscles in other lesions affecting the lower motor neurone, and it may be thought of as matter of reproach that we have so long evaded the questions raised by this striking symptom. That pain and tenderness in muscles add to the sum total of their weakness, and may even influence the efficiency of other muscles normally associated with them in co-ordinated movement, is possible. It is also possible that the relief of spasm and of pain by hot applications brings relief to the patient and may facilitate the use of such motor function as the muscles possess. It is further reasonable to suppose that the intensive care and superb nursing that are stated to be a part of Sister Kenny's methods will yield better end-results than the somewhat perfunctory treatment that not rarely attends the later stages of the illness in cases of poliomyelitis. But all this is a far cry from the extreme claims made for the treatment, and a matter unrelated to the theoretical concept of the disease poliomyelitis that has been built on these irrelevant considerations. Nevertheless, one can picture the situation of Sister Kenny bringing before her doctors her sense of the importance of spasm and its treatment, and finding that they were not impressed by either its presence or its importance. As a not unnatural result she has concentrated on a partial view of the symptom-complex of poliomyelitis, and has sought to force its importance, as she conceived it, upon general opinion by making it the basis of a quite fantastic conception of poliomyelitis.

It would have been better had Sister Kenny and her supporters been content to subject her methods to adequate and prolonged trial, and to have let them stand or fall by their merits. The situation has been unnecessarily and adversely complicated by the intrusion of theoretical fantasies that can only prejudice the issue. Sister Kenny claims that her concept has been accepted by the American Medical Association and by the National Foundation for Infantile Paralysis; but until the general body of authoritative opinion, so weighty in the United States, has spoken on this issue, we find it hard to believe that this concept can command any assent among those whose experience entitles them to judge.

RESETTLEMENT OF THE DISABLED

The proposals of the Tomlinson Committee, more properly known as the Interdepartmental Committee on Rehabilitation, included the scheduling of certain occupations for the benefit of disabled persons and the establishment of a register of such persons. These expedients are criticized in a memorandum issued by the Central Council for the Care of Cripples. It is contended that such a schedule and register would have most unfortunate effects, particularly in fixing attention on the disability to the exclusion of the rest of the individual. After all, the most important thing about a man who has lost a limb is not the amputated limb but the fact that he is still a man with three limbs intact, together with a brain and other valuable faculties, all in good condition if he has been properly treated while in hospital. Even the functions of his amputated limb, if the stump has been well fitted with an appliance, may have been largely restored. If, therefore, he is to be registered at all, it is misleading to take account only of the anatomical defect and to categorize him on that basis. There is something to be said for the Tomlinson proposals, which were framed to ensure some avenues of employment for the disabled; but obviously everything turns on the interpretation of disablement and on the assessment of the man's abilities apart from it. It is not enough to say that all one-armed men must be considered only for certain occupations. That would have been to exclude from his employment a former Minister of Health, not to speak of the greatest of British admirals. (Some other objections to the registration and quota system are put forward in a report presented to the L.C.C. on July 27 by one of its committees, the chief being that the quota system would carry with it the suggestion that disabled persons are a liability to the employer.)

The Central Council holds that if there must be a register it should be one of employers who have troubled to study the industrial efficiency of various kinds of handicapped workers and to encourage them. A schedule of reserved occupations for disabled persons would have the disadvantage that such occupations would come to be regarded as the proper objective for employment of such persons without regard to individual capacity or intelligence. The solution of the problem, in the Central Council's view, would be better sought along the following lines: (1) a complete health service as called for under Assumption B of the Beveridge plan; (2) an educational campaign among medical and auxiliary medical personnel and also among employers and even legislators, on the broad principles of the adaptation of medicine in industry; (3) a better service of information so that people may be more readily and expertly advised as to the facilities available for treatment, training, and employment; and (4) the replacement of the present Workmen's Compensation system by a comprehensive health service linked with such arrangements for social security as might be thought appropriate.

One direction in which the State itself might give a lead is pointed out in the memorandum—namely, by relaxing the present stringent rules for a health standard on entry to the Civil Service. Those rules were framed largely with superannuation schemes in view, so as to ensure a good expectation of life among the persons accepted, and also a low rate of sickness absenteeism. But in fact, says this memorandum, among any large group of injured persons taken two years after the occurrence of the injury the expectation of life does not differ materially from that of a normal group. As for sickness absenteeism, a large proportion of this is known to be due to minor respiratory infections, dyspepsia, and nervous complaints, to which the disabled as a group are not specially prone.

It should be added that the Central Council does not criticize in any wholesale manner the Tomlinson report. Much that the report contains it describes as sound and stimulating, and this in spite of inauspicious beginnings, for it is pointed out that the appointment of the committee was never publicly announced, and only at a late stage was the decision made to publish its report. The committee consisted entirely of members of the Civil Service, and "the conclusion appears irresistible that it was contemplated that a few civil servants should confer privately among themselves, and out of their own knowledge and experience should produce a scheme for the training and placement of the disabled." If that is so, it is all the more gratifying that the report as a whole should find favour among people of great experience in the care of the physically handicapped.

"SHOCK" FROM VENOUS OCCLUSION

Research workers are very ingenious in reproducing the symptom complex seen in man as a result of depletion of circulating blood volume and known vaguely as "shock." Not content with simple removal of whole blood or plasma from the veins, investigators have devised elaborate methods of accomplishing the same ends unlike anything to be seen in man (even in this present period of scientifically directed trauma) either in the operating theatre or on the battlefield. They then devise methods for preventing or treating the ill effects of their interference. The usual sequence is first the recognition of a clinical syndrome and then its "reproduction" in animals. Recently Phemister[1] described a case of a woman who developed "shock" with low blood pressure and haemoconcentration due to loss of 4 litres of plasma after thrombosis of the veins of the leg. This appears to be the only recorded human case of a type of "shock" analogous to that produced experimentally by Katz and his colleagues.[2] After ligation of the common and internal iliac veins of one side and the injection into the distal end of a solution containing carbon particles the occluded leg became swollen and cold; the blood pressure fell progressively and haemoconcentration of +40% occurred. The swelling was due to local loss of plasma, and blood also; it amounted to 5% of the body weight. The severity of this shock response could be modified and the survival rate increased from 13 to 70% by "priming" doses of desoxycorticosterone.[3] By its action on fluid equilibrium the rate of accumulation of fluid locally was decreased, thus giving time for the natural compensatory processes. The haemoconcentration and fall of blood pressure after this procedure could be entirely prevented by enclosing the lower limbs and groins in a plaster cast.[4] When the cast was removed at 36 hours the occluded limb swelled at a rate about one-fifth of that in the untreated controls and without any systemic disturbance. It is concluded that the rate of loss rather than the amount of fluid lost is what determines the genesis of "shock." The authors consider that this method of preventing "shock" by plaster casts might be used in civilian and military crush injuries (as indeed it has been by Trueta[5 6]). It has also been shown to prevent the fatal shock following freezing of a leg in dogs.[7] Duncan and Blalock,[8] working along "crush injury" lines, have recommended an inflatable rubber boot, again on the basis of animal experiments. For those who have not seen crush

1 Phemister, D. B. (in discussion), *Ann. Surg.*, 1940, **112**, 617.
2 *Amer. J. Physiol.*, 1941, **134**, 755.
3 Ibid., 1942, **137**, 79.
4 Ibid., p. 589.
5 *Lancet*, 1939, **1**, 1452.
6 *British Medical Journal*, 1942, **1**, 616.
7 Fell, E. H., and Hanselman, R., *Ann. Surg.*, 1943, **117**, 686.
8 Ibid., 1942, **115**, 684.

injury clinically it must again be stressed that "shock" in this type of case is not the immediate cause of death, except in patients suffering from other injuries and in those unable to obtain fluid replacement: these die in the first twenty-four hours. Most patients who die do so on the sixth day with a raised blood pressure and in uraemia. The clinical problem is to prevent renal damage, and it is to be hoped that this will receive prior attention from experimentalists.

THE TEACHING OF OPHTHALMOLOGY

The recent Oxford Ophthalmological Congress had a stimulating debate on education in ophthalmology. The apple was thrown by one participant who declared the teaching of ophthalmology to undergraduates to be a waste of time, because, he said, it was so rare for any of them to show interest in the subject. When they became general practitioners, he continued, they divided themselves into (*a*) those who sent every eye case direct to the ophthalmologist and (*b*) those who treated it with drops for a few days before doing so. Someone else suggested that there was a third class consisting of those who sent all eye cases to the refractionist. In the opinion of this speaker the student must have six months' whole-time work in ophthalmology if he was to gain more than a smattering of the subject, and the time should be spent under more than one teacher, so as to acquire an adequate outlook. These were extreme views and found little support from the general body of the Congress. An older ophthalmologist, with an experience of thirty years of undergraduate teaching, agreed that while the present system had brought into existence first-class eye specialists it had not produced general practitioners with an adequate knowledge of the fundamentals of the subject or even of the meaning of vision. He ascribed the trouble to the fact that the mind of the student is directed to the passing of his examinations, and naturally he devotes himself to the larger subjects, giving attention to the specialties only to the extent necessary to obtain a certificate. Another complaint is that there are few good books of ophthalmology for general practitioners, such books as are available being condensations of the ophthalmology needed by the ophthalmic surgeon, whereas the undergraduate intending general practice needs something different. One examiner for the diploma in ophthalmology complained of the general run of candidates who presented themselves. He said that many of them had no idea of how to answer a written question, having never, apparently, been taught the principles of composition at school; to draw an adequate diagram in illustration of their point was quite beyond them, and manual dexterity was poor. But, as someone else remarked, a man who can draw may be wholly unable to use the ophthalmoscope. One teacher said that he declined to teach the use of the ophthalmoscope to a student who did not possess one of his own, just as, if he were a golfing instructor, he would refuse to teach golf to anyone who did not possess clubs.

The procedure at Oxford interested the Congress. Before the war Oxford medical students took their clinical teaching in London. Now clinical training is being given at the local hospitals, where it is not fettered by tradition and long usage. The ordinary routine of the out-patient department of the eye hospital has been by-passed as likely to be of small service to those not yet qualified, who start with lectures and demonstrations in the use of instruments, practising on one another, and then are given clinical demonstrations on selected cases of the commoner conditions they are likely to meet in practice. It was the general feeling of the Congress that, whatever might be said in criticism of the methods of teaching ophthalmology or of the standard of ophthalmology in general practice, the G.P., in this field as in others, is a key man. He is the first, as a rule, to see any visual abnormality. Therefore it is essential to have properly co-ordinated teaching for his benefit. It is a question not only of the knowledge of ophthalmology desired in the newly qualified G.P., but of the knowledge of general practice desired in the specialist, into whose hands, mainly, the teaching of medical students is committed. In an ideal medical world every consultant would have had some first-hand experience of family doctoring; but, as things stand, it is difficult for most of those who are going to become specialists to pass through a period of general practice without missing appointments they might otherwise expect. Advance in any direction is bound to be through specialties, but in order to counteract the evils of over-specialism some form of co-ordination must be worked out—the kind of team work which has already proved of such use in research and in other fields of medicine.

MALNUTRITION IN CEYLON

"Spicy breezes" do not bring the gift of health to Ceylon. The infant death rate among the non-European population is nearly three times and the maternal death rate nearly four times that of England and Wales. Moreover, poor stature and physique abound. That this low physical condition is due to a dietary rather than to a racial factor is shown in an illustrated pamphlet entitled *Nutrition in Ceylon*, published by the Society of Medical Officers of Health in the colony, which mentions that, while the children of the poorer classes are small and stunted in growth, those better-to-do are tall and well built, so that there is nothing inherent in the Ceylonese to assign him a low physical standard. Surveys of the poorer class of school children reveal that 7.7% of them are afflicted by "sore mouth," a manifestation of riboflavin deficiency, and 29% by a skin eruption known as phrynoderma ("toadskin"), due to want of vitamin A. Keratomalacia is also a serious affliction among infants and young children, and two-thirds of the many blind children in Ceylon are said to owe their blindness to that cause. A dietary survey carried out in a rural population has shown that 39% of the families got less than 2,000 calories per adult unit per day. The diet of the Ceylonese is also ill balanced, containing too few pulses and vegetables and too little animal food. The absence of animal food seems curious in an island with a coast renowned for its abundance of highly nutritious small fish. The Ceylon medical officers are not content to state the position: they make definite recommendations, some of which call for the attention of the Government. They urge that rice, the staple diet, which now supplies about 70% of the total calories, should be supplemented by wheat, maize, and millets; also that pulses, sweet potatoes, and yams—all readily grown in Ceylon—should be more used, that more fish should be sold, and more milk provided for young children, with buffalo milk in the form of curd for older children and adults. Attention is also drawn to the importance of education and to the nutritional needs of the expectant and nursing mother and the school child.

Drugs, medical, surgical, and hospital supplies of all descriptions are urgently needed for China, who has five million men in the field and an immense amount of sickness with which to contend owing to the alarming spread of contagious diseases. The Ministry of Shipping provides the necessary shipping space and Lady Cripps's United Aid to China Fund is appealing for help in supplying these things, of which our gallant ally is so short. A collecting centre at 121, Westbourne Terrace, London, W.2, has been opened, and shipment of drugs and medicines has already begun. The headquarters of the Fund are at 57, New Bond Street, W.1.

RESUSCITATION WARD IN AN E.M.S. HOSPITAL

BY

DANIEL LAMONT, M.B., Ch.B., F.R.C.S.Ed.
Interim Surgeon-Consultant, County of Zetland

This description of the accommodation provided for severe war casualties is submitted in the hope that it may be of interest to those who, like myself, have to treat patients suffering from exposure as well as wounds. The layout of the ward is the result of three and a half years' experience of treating such patients, many of whom are, literally, brought straight out of the sea. At one time, before Norway and Denmark were overrun and the then neutral shipping was being constantly attacked, the most appalling injuries were encountered in seamen of diverse nationalities. There might be injured Norwegian, Arab, Greek, Finnish, Swedish, and Icelandic nationals all in one ward at the same time.

When a Danish vessel was torpedoed in the Atlantic on a wild January night in 1940 the chief engineer was blown out of his engine-room when the first torpedo struck, and blown back inboard by the explosion of a second; then part of the cargo fell on top of him. By this time he had sustained compound fractures of both lower limbs, crushed thorax, and fracture of the ribs. He took to the icy sea, where, supported by his life-saving jacket, he was immersed for two hours before being picked up. After a voyage in a small storm-tossed vessel he was landed without the aid of any stretcher at a port on the west side of the Shetland Isles. Before being rushed to hospital he had to be questioned by the intelligence authorities. (However undesirable this may be for a shocked patient, it is necessary; in this case the safety of other ships was involved.) This man survived, but that is more a tribute to his own vitality than to any resuscitative measures, although skilled nursing, which is a vital factor in all shock cases, played its part.

Again, six Arabs, members of the crew of an oil tanker, were adrift in a waterlogged ship's boat for ninety-six hours; all of the men were suffering from petrol-burn injuries, more or less severe, and were without drinking-water. A child on board was supported on the knees of each of the men in turn to prevent her from being drowned in the bottom of the boat. In their case resuscitative measures were the clamant need. A Norwegian seaman escaping from Norway after we came away from Narvik was five days in the sea after his *sköyte* (small fishing vessel) was sunk under him. On being rescued he insisted on accompanying a unit of the Royal Navy to direct this craft to where he had last seen his skipper clinging to a piece of wreckage. During this venture he was shot through the abdomen by a marauding Heinkel. The skipper was found, and the Norwegian sailor had six lacerations of the small bowel repaired when his abdomen was subsequently opened. He now wears the Royal Norwegian Order of Saint Olav.

A pilot of the R.A.F. engaged in air operations during the Vaagso combined operation had his left femur shattered by "flak" entering the bottom of his aircraft. In the course of his "evasive action" he struck a rock and the starboard air-screw went out of action. He kept air-borne on one engine for some hundred miles and then came down in the sea. He was picked up, more dead than alive, by the Air-Sea Rescue Section. On admission to hospital gangrene of the limb was already starting. An example of aggravated injury was provided by a sturdy young Westphalian, an *Unteroffizier* air-gunner whose pilot was forced to "crash-land" on an isolated island in the ocean. On making a "pancake" landing the bottom of the aircraft was smashed in, killing the remainder of the air crew and pinning the air-gunner in the wreckage, his lower limbs being severely lacerated and fractured. He was extricated and brought to hospital by a Royal National Life-Boat Institution vessel, which made a ninety-mile trip in a heavy beam sea to effect the rescue. He was suffering from surgical shock, intensified by bad sea-sickness and terror at what lay ahead; before his enforced descent he had succeeded in killing by machine-gun fire the wife and daughter of the islands' light-keeper. The number of such examples of injury *cum* gross exposure is legion, but arising out of these experiences a technique has been evolved for giving the most effective restorative measures with the least possible delay.

General Plan and Equipment

The solutions carried on the dressing trolley may not find general acceptance, but security reasons preclude a free discussion of my choice. Suffice it to say that the types of wounds now being encountered necessitate a preparedness on the part of the surgeon to cope with injuries contaminated by a variety of chemicals, of which phosphorus is but one; picric acid is another. My rule is, when there is an element of doubt, to use distilled water for irrigation of contaminated wounds, particularly those of the eye, until such time as I can have expert guidance from the Ordnance Department, who have at all times shown their readiness to co-operate by providing the services of an analytical chemist.* Apart from that, the simplest materials are used in the resuscitation ward, as all unnecessary interference liable to disturb the patient is discountenanced. Cases of frost-bite and of immersion leg are not treated in this ward unless there are concomitant injuries. For these vasomotor disturbance cases a special ward is reserved. In general the line of treatment is elevation of the part and abstention from all frictional treatment or application of heat. Morphine with atropine is freely given, and ultra-violet therapy or actual heliotherapy (when available!) has done good in cases where the penis is involved.

Hiccup is a most distressing symptom in recent immersion derangements, and the morphine–atropine combination appears to help. Thoracic blast injuries from depth-charge or mine explosion are treated in the ward in the sitting posture. Contrary to the experience of some, I use plasma infusion freely. Atropine is given hypodermically, and pulmonary oedema has not obtruded. The effect of the plasma is most gratifying in these profoundly shocked thoracic cases. The ward is adjacent to the operating theatre. Immediately outside the entrance is the poisons cupboard, in which are ampoules of alopon 2/3 gr., atropine, coramine, strophanthin, and eucortone. Sal volatile, a humble but very useful drug in some cases with emotional disturbance, is ready to hand. The type-testing sera and the antitetanic and polyvalent anti-gas-gangrene sera are stored in a calor gas refrigerator outside the door. The blood bank, under the aegis of the Scottish National Blood Transfusion Association, is not far distant. A supply of tetanus toxoid for use in appropriate cases is available.

The ward is constructed of reinforced concrete and is proof against all but a direct hit.

Ward Fittings

1. Thermostatically controlled heating system set to maintain temperature of 68° F.
2. Hand-operated ventilators of "louver" pattern.
3. Electric lighting system from mains supply.

Bed Fixtures and Accessories

1. At the head of each bed on a wooden panel are: (*a*) Arcus quick-coupling unit connected with Heidbrink control unit attachment on oxygen cylinder of 100 c.ft. capacity. Incorporated in each unit is a dry-bobbin flowmeter; delivery is by B.L.B. mask. (*b*) Plug for electric blanket, which is insulated from the patient by rubber sheeting; the current is switched on day and night for a few beds only when the ward is unoccupied. (*c*) Plug for aluminium radiant-heat cage with six independently controlled bulbs and thermometer; these cages are so light that any nurse can easily lift them with one hand. (*d*) Plug for hand lamp. (*e*) Bracket at approximate height of 3½ feet above receiving vein for blood-transfusion bottle.
2. Temperature–respiration–pulse chart on which half-hourly observations can be recorded if necessary.
3. Back-rest for sitting posture in thoracic cases.

Ward Furniture and Apparatus

1. Portable *x*-ray plant for use primarily in abdominal and thoracic wounds; this plant can also be used therapeutically, but this measure is still on trial for cases already infected.
2. Emergency accumulator light of "anglepoise" type.
3. Emergency hurricane lamps.
4. Dispensary basket for transporting bottles of plasma or stored blood from adjacent blood bank.

* Boric acid solution should be avoided in treating eyes if unknown chemicals may be present; extremely dangerous compounds may be formed.

5. Wooden arm-board for each bed for blood transfusion by the arm. The sternal canal may occasionally be used as adjuvant "slow-drip" route when veins are very collapsed and delay is unavoidable.

6. Low stool at bedside for operator (this is important, as it is very fatiguing to bend over these low "emergency" beds for any length of time).

7. Blocks 18 inches high for elevation of the foot of the bed. (These require some arrangement on the upper surface to keep the legs of the bed from slipping when the patient is restless. I have attached "U"-shaped pieces of wood to receive the bed legs.)

8. Hand-washing basin.

9. Dressing trolley, on which are carried: (*a*) solution of 1/1000 acriflavine rendered alkaline by addition of sodium bicarbonate; (*b*) solution of sodium bicarbonate, 0.5%; (*c*) solution of copper sulphate, 2%; (*d*) solution of copper oleate and trichlorethylene (still on trial for neutralization of external wounds contaminated by phosphorus); (*e*) normal saline (sterile); (*f*) distilled water; (*g*) albucid soluble, butyn 2%, and undine; (*h*) tubes of flavogel; (*i*) tourniquets, Esmarch's bandage type; (*j*) Riva-Rocci blood-pressure apparatus; (*k*) agglutination tubes charged with a few drops of a solution of sodium citrate 1.5, sod. chlor. 0.9, distilled water 100.0, for direct blood agglutination test; (*l*) insufflator charged with 3 g. sterilized sulphathiazole powder; (*m*) Record syringes 1, 5, and 10 c.cm.; (*n*) metal and rubber catheters.

Staffing

1. Nursing staff: (A) A receiving sister and assistant nurse superintend putting the patient to bed and remove life-saving jacket and such clothing as is necessary. (B) The theatre sister and radiographer are in attendance.

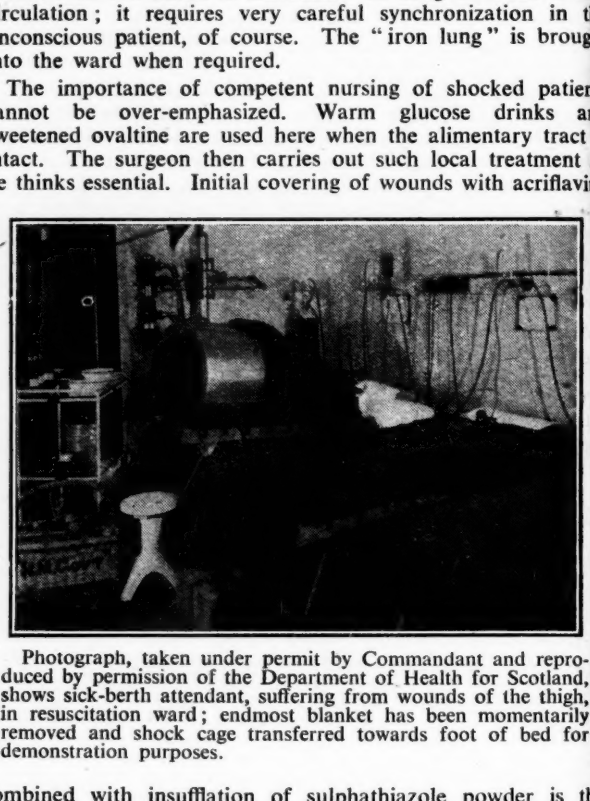
2. Medical staff: (A) The receiving surgeon conducts a preliminary survey and orders immediate resuscitation methods. He decides the amount of alopon to be injected and the mode of administration. (B) The resident house-officer immediately types blood and carries out direct agglutination tests against the blood of a waiting donor or against the bank blood, whichever is to be used. He also carries out catheterization, if ordered. He may have to estimate blood pressure, haemoglobin percentage, and mean corpuscular volume in a Wintrobe tube after centrifugalization. Blood urea is estimated in a Lovibond comparator, if such investigation is ordered. This colorimetric method is sufficiently accurate for practical clinical purposes; it is also used for estimation of sulphonamide concentration in the blood. (C) A specialist anaesthetist is in attendance and is consulted on the appropriate form of anaesthesia in each case. Boyle's apparatus with CO_2 absorption attachment is mainly used, but regional anaesthesia is sometimes helpful. Pentothal is often used, but the impression here is that it is not so reliable as the evipan of former days. In this hospital the specialist anaesthetist also gives the blood and plasma infusions.

Resuscitation Procedure

As regards resuscitation measures generally, in my view the tendency is to give too much morphine to the shocked patient. In this hospital 2/3 gr. of alopon (equivalent to 1/3 gr. of morphine) is a maximum initial dose. If the patient's pulse is imperceptible at the wrist I content myself with the equivalent of 1/4 gr. or even 1/6 gr. of morphine intramuscularly to begin with. I am then guided by the patient's response to the other measures as to when and in what amount to give another injection subcutaneously (usually in 2, 3, or 4 hours in doses of 1/6 gr.). Eucortone has a limited place in conjunction with morphine in the treatment of these cases. It must be used with great discernment. If the patient is pulseless to begin with and after the lapse of an hour there is no improvement 5 minims of eucortone can be injected intramuscularly. Often the pulse will reappear in five minutes, but if it does not then no further hormone should be given. If improvement does occur a further 10 minims can be administered after another hour. The temperature then will probably rise above subnormal.

Experience has taught us to use oxygen sparingly in those patients who do not have compression–expansion lesions of the lungs. When it is employed the guide is the patient's reaction: if he is intolerant or resentful of it the flow is stopped. Oxygen has a very real value in cases in which there is a combination of gaseous asphyxia and shock caused by "near-miss" detonations. Whole blood is never given by itself to the shocked, exsanguinated patient; if he requires blood then double the amount of plasma is administered—half before the blood and half after it. If the patient lapses into unconsciousness, strophanthin or 4 c.cm. of nikethamide (coramine) intravenously is given, mostly as a policy of despair. Artificial respiration in the "iron lung" has been tried, but it is too early yet to assess its value. It does seem worthy of further trial because the aeration of the blood is maintained so long as there is any circulation; it requires very careful synchronization in the unconscious patient, of course. The "iron lung" is brought into the ward when required.

The importance of competent nursing of shocked patients cannot be over-emphasized. Warm glucose drinks and sweetened ovaltine are used here when the alimentary tract is intact. The surgeon then carries out such local treatment as he thinks essential. Initial covering of wounds with acriflavine



Photograph, taken under permit by Commandant and reproduced by permission of the Department of Health for Scotland, shows sick-berth attendant, suffering from wounds of the thigh, in resuscitation ward; endmost blanket has been momentarily removed and shock cage transferred towards foot of bed for demonstration purposes.

combined with insufflation of sulphathiazole powder is the routine if a long interval is expected before the patient can be removed to the operating theatre. In eye injuries the appropriate irrigation is gently carried out, and if a foreign body is to be removed and difficulty is anticipated butyn is instilled to add to the comfort of the patient. Burns can be temporarily dressed with flavogel, and if they are not too extensive up to 3 g. of sulphathiazole is insufflated as a temporary measure. Most burns of the limbs will be encased in plaster-of-Paris after operation. When there is some doubt as to the cause of burns all lights are extinguished so that the presence of phosphorus may be detected; reliance should not be placed on odour, as some modern combination explosives are free from all odour of phosphorus. The surgeon personally administers the appropriate initial prophylactic dose of antitetanic and polyvalent anti-gas-gangrene sera. He finds out if he can—though it is often impossible—whether the patient has had tetanus toxoid. Thereafter he enters on the chart the further doses that are to be given and at what intervals. If tetanus toxoid is appropriate to a particular case he gives the "boosting" dose.

The patient remains in the resuscitation ward until the receiving surgeon decides that it is time for him to go to the operating theatre; the distance is short, but a shock cage, with accumulator, is carried on the trolley.

The British *X*-Ray and Radium Protection Committee issued its first recommendations in 1921, and revised reports followed in 1923, 1927, 1934, and 1938. The problem of adequate protection for the *x*-ray worker has been substantially eased by the introduction of the self-protected tube and by the "shock-proof" tube and equipment. Account is taken of this in the sixth report, which follows in the main the form of the International Recommendations, and contains a number of alterations and additions based on the experience of the British Committee and of the National Physical Laboratory. Copies can be had from the honorary secretaries of the Protection Committee at 32, Welbeck Street, W.1, or from the director of the N.P.L., Teddington, Middlesex.

COMING-OF-AGE OF HOSPITAL SAVING

The Hospital Saving Association, the great contributory organization for the London area, was inaugurated in 1922 as a result of one of the recommendations of the Cave Commission to inquire into the finances of voluntary hospitals. It was from the beginning a characteristically British blend of self-help and public service, and the double idea of saving the hospitals—for that was the original motive behind the Association and the inspiration of its title—and at the same time of ensuring hospital treatment for the contributor and his family when needed proved immensely fruitful. The H.S.A., which in its first year had 15,000 members, now talks in terms of millions. At a twenty-first birthday celebration held at Westminster Central Hall the chairman, Sir Alan Anderson, was able to announce that the contributors now number nearly two millions and their contributions weekly amount to well over one million pounds a year. Since the H.S.A. started its work over ten million pounds has been paid or set aside for hospital services, and the total number of patient-days of hospital treatment given to its contributors and their dependants would extend over about 120,000 years. The celebration was attended by the Duchess of Gloucester, the Minister of Health, prominent representatives of the medical and nursing professions, and heads of large business concerns, including the chairman of London Transport, in which are to be found the largest number of contributors in any single employment.

The occasion was something more than an outstanding anniversary; it was a demonstration of faith in the voluntary system. As the Minister of Health said in his brief address, whatever the future may hold in store, no comprehensive service can do without the spirit which has created and sustained the voluntary hospitals. The hospitals themselves, he said, were indispensable to the services which it is hoped to evolve, and equally indispensable are the attitude of mind and constancy of purpose which have been displayed in supporting them. To mark its coming-of-age the Association hit upon the pleasing idea of making an offering to the nursing profession in token of gratitude for the services rendered by hospital nurses to its members. This took the form of a fund for providing scholarships for nurses, and a sum of just over £12,000 was handed to the Duchess of Gloucester for this purpose. The nurse who wishes to qualify for a higher position, such as that of sister-tutor for example, has to relinquish her work during her year of studies, and if she has no private means she is gravely handicapped. It is to meet such a situation that this gift has been conceived.

HARBEN AND SMITH AWARDS

At a meeting of the Royal Institute of Public Health and Hygiene held on July 8 the Harben gold medal was presented by Prof. J. W. H. Eyre, the president, to Sir Henry Dale, President of the Royal Society, and the Smith award (a bronze figure of Hygeia) to Dr. James Fenton, medical officer of health for Kensington.

Mr. W. E. Tanner, chairman of the council, in presenting Sir Henry Dale for the award, referred in particular to his work on acetylcholine, begun in 1914, and quoted the *British Medical Journal* as stating, in 1938, that the brilliant researches of Dale had helped to build up step by step a firm structure on which rested the belief that acetylcholine transmitted the effects of nervous impulses from the nerves to the organs throughout a large part of the body. He also reminded the company that in 1936 Sir Henry Dale shared the Nobel Prize (Nobel Laureateship) for physiology and medicine. He had made the laboratory his field and had always maintained that with the disappearance of the earlier separation and critical rivalry between experimental research on the one side and empirical observation at the bedside on the other, and with the formation of a common front of advance in medical science, medicine would move towards the creation and maintenance of the conditions of health, not limiting itself to the recognition and treatment of acute or obvious failures and anomalies.

Sir Henry Dale, in response, mentioned the names of former Harben medallists, beginning with Pasteur in 1895, and Sir John Simon in the following year, and continuing with Lister, Koch, Metchnikoff, Gorgas, Ronald Ross, Sherrington, Hopkins, and others. One of the medallists was Baron Kitasato, the Japanese scientist, who received the medal in 1925. "We should not fail to honour his memory," said Sir Henry Dale, "although his country has departed from its old traditions. Baron Kitasato worked for the health of all mankind."

In presenting Dr. James Fenton for the Smith award (an award created in memory of Sir W. R. Smith) Mr. Tanner said that Dr. Fenton had been M.O.H. of Kensington since 1920. Before that he had held appointments in Shrewsbury, Birmingham, and Southampton. He had been president of the Society of Medical Officers of Health, chairman of the Central Council for Health Education, and chairman of the council of the Royal Sanitary Institute. Reference was made to the fact that the Kensington Borough Council had established under his advice the first municipal clinic for acute (and later for chronic) rheumatism in this country, also to his good work for civil defence.

Dr. Fenton described the work he had done as team work, and said that many who had laboured side by side with him should have shared in the honour. A medical officer of health could achieve little without the support of his local authority, and in that respect he himself had been most fortunate. His local authority had enlarged his interest and stimulated him to introduce measures for the public benefit. It had also afforded him financial help in his studies of public health in America, Africa, and on the European Continent.

Correspondence

Subcutaneous Ligature of Varicose Veins

SIR,—I note with concern two recent articles in the *Journal* advocating the disinterment of the subcutaneous ligature of varicose veins from the shades to which it had been decently committed. Starting an honourable career more than 100 years ago, we find it adolescent in the hands of Davat, who in 1838 was devising ingenious methods for its application (*vide* Ochsner and Mahorner, *The History of the Treatment of Varicose Veins*, 1939). After an adventurous and popular career it was finally laid to rest when the injection treatment of veins became standardized in the present century. Nails from all parts of the world have been driven into its coffin in the shape of the recognition of the recanalization of thrombosed and ligated veins, and of the dilatation of tributaries to replace an excised primary vein. In fact, throughout the literature on the subject it is now generally agreed that in cases showing a positive Trendelenburg sign this re-establishment of circulation renders ineffective any ligation and excision of the saphenous vein below its junction with the femoral vein. In an excellent critical analysis of the results of various operative procedures, Moore and Knapp (*Ann. Surg.*, 1942, **115**, 131) by not even mentioning subcutaneous ligature showed that its requiems had been said. They showed that ligature and excision of the saphenous vein actually at its junction with the femoral vein is the only procedure which gives reliable results, their best series being that in which this procedure was combined with a simultaneous injection of sclerosing fluid down the vein. Clinical experience bears this out. Any lesser procedure fails to recognize and deal with the primary cause of the condition—namely, an inefficiency of the valve guarding the upper end of the saphenous vein.

In the treatment of men in the Forces, even more than in civilian cases, the adoption of a method of treatment which is liable to a considerable number of recurrences seems to me an ill-advised policy. What if the recurrence occurs just when the man is most needed for active service over-seas? How shall we explain to him after his recurrence that a second operation is more likely to be successful than the first? In my own experience it is only in such men or in others who have come in contact with them that one meets difficulty in obtaining consent for operation. I feel that more valid reasons and very much more favourable follow-through results are essential before we revert to the procedure of subcutaneous ligature.

Dr. R. R. Foote (*Journal*, July 3, 1943) wisely refers to the subject of pulmonary embolism following operation for varicose veins. The danger of this complication does not seem to be fully recognized in this country. For instance, in Payne's comprehensive article (*Journal*, Oct. 18, 1941) no mention is made of it. Yet in Moore and Knapp's series

of 169 cases there were two deaths from pulmonary embolism, a third case fortunately recovering; whilst in 162 operations for varicose veins at the Peter Bent Brigham Hospital, Boston, between 1913 and 1921, three deaths from this cause were recorded. Pulmonary embolism is thus a very real danger, causing a mortality in these two series of nearly 2%. I therefore fully agree with Foote's conditions that in operations for varicose veins (1) the patient should be ambulant, and (2) the ligation should be at the sapheno-femoral junction—the first in order to maintain the circulation in the femoral vein, the second to avoid clot formation in the saphenous stump (a possible source of a pulmonary embolus) and to destroy unequivocally all the tributaries of the upper end of the saphenous vein.

In the ambulatory method I admit that there is a slightly increased risk of wound infection owing to movement of the dressing, touching the inside of the clothes, etc., but an occlusive dressing, such as a strip of elastoplast, applied on the table and removed only with the stitches, does much to eliminate this. In 130 cases treated on these lines I have seen no case of pulmonary embolism and only five cases in which the hospital stay had to be prolonged beyond the normal 48 hours. This, I think, largely answers Major Goldstone's observations about the saving of hospital bed space.—I am, etc.,

Southend General Hospital. A. K. MONRO, F.R.C.S.

Lectures on Industrial Diseases

SIR,—The General Medical Council recently decided that medical students should receive training in the subject of industrial diseases. So far as I can discover systematic courses of lectures are not being provided in our medical schools. In the memorandum published in your issue of June 5 it is suggested that "when the medical school is near an industrial centre the theoretical teaching in industrial medicine, which is obviously to play an important part in future medical practice, should be supplemented by visits to neighbouring factories." But where is such theoretical teaching to be found at the present time? In most, if not all, of our teaching centres facilities for visiting factories are certainly not lacking, but the theoretical teaching is. Why this delay in establishing lectureships in this important subject? Is it that competent lecturers with the necessary knowledge do not exist? I admit that it may be difficult to find men who possess the necessary combined medical and legal knowledge to enable them to teach this subject, for a certain amount of legal knowledge is required to teach it properly. In every large centre of medical education, however, surely at least one suitable lecturer does exist. This delay in establishing such lectureships is a great mistake, as a knowledge of industrial diseases is of the utmost importance at the present time and will become of still greater importance after the cessation of hostilities. In this country we always seem to lag behind. In this instance such slowness of action is inexcusable. I sincerely trust that our teaching institutions will wake up and take some definite action in this matter, which to my mind is an urgent one.—I am, etc.,

Edinburgh. JAMES BURNET.

Cutaneous Hypersensitivity to Sulphonamides

SIR,—I was interested to read the report of Major R. G. Park (July 17, p. 69) on cutaneous hypersensitivity to sulphonamides, and to know that others were experiencing this hypersensitivity in certain individuals.

In a busy casualty department I have used a large amount of sulphanilamide, mostly in the powder form, for dressings. Out of the many scores of patients thus treated I have had 5 in the last four months who have developed an acute exudative dermatitis. At first, not knowing the cause, the sulphanilamide powder was continued with increased amounts. This only made matters worse. On changing the dressing to gentian violet or a triple dye I found that the dermatitis quickly dried and then cleared.

The worst case was a small wound of the left palm with the weeping dermatitis extending over the whole hand. None of the patients was taking sulphanilamide by mouth, and control test applications were not carried out.—I am, etc.,

General Hospital, Rotherham. A. W. N. DRUITT.

SIR,—Perhaps a personal experience will help to give point to the excellent article by Major R. G. Park.

I underwent operation on March 22 for a fistulous condition, involving a long and deep incision. The wound was left open to heal by granulation, and a packing of sulphapyridine (M&B 693) in liquid paraffin was employed. This dressing was continued daily up to May, when it was abandoned. The wound eventually healed completely in June, but an area of skin rather more than an inch wide on either side of the scar remained inflamed and intensely irritable, and itching was very great, especially around the anus. A slight serous exudate persisted.

On July 14, on the advice of my surgeon, I used pulv. anaesthesin (May and Baker) to allay the itching, it not being appreciated that I may be suffering from sulphonamide hypersensitivity. As the area continued to be inflamed I tried a dressing of sulphapyridine in paraffin. Next morning I had a violent reaction, characterized by increased and intolerable itching and a profuse exudation from the area, so profuse that pads of gamgee tissue placed over a dry dressing were soaked through. I then stopped all forms of local medication. Within 48 hours the inflammation began to subside, but at the end of this period a well-marked morbilliform eruption appeared in the palms of both hands, itching was general though not intense, and affected the face, knees, and dorsa of both feet.

At the time of writing the area round the wound is still inflamed and irritable, the papular condition of the palms has not subsided, and I have no idea how long this state of affairs will last. It was only by accident that I read Major Park's article and learnt the meaning of my condition. I felt that the general reaction was due to a drug, and I had the choice of three drugs: (*a*) *dettol*, as I had been having dettol baths; (*b*) *pulv. anaesthesin*, used twice; (*c*) *sulphapyridine*, reapplied after an interval. Major Park's article gave me the explanation.

Two aspects of my case I should like to stress: (*a*) the profuse nature of the exudate, and (*b*) the inordinate redness of the area of dermatitis. As Major Park points out, such hypersensitivity may seriously limit the use of these valuable drugs, and calls for investigation of the means of desensitization.—I am, etc.,

"MEDICAL."

Transmission of Kala-azar by the Sandfly

SIR,—In your interesting annotation on the transmission of kala-azar (July 10, p. 45) you refer to recent work on the breeding of sandflies. It is not perhaps generally remembered that our present knowledge of the life-history of the insect and the methods of breeding it in captivity are mainly due to the painstaking work of Whittingham and Rook in Malta between 1921 and 1923, who worked there as members of the R.A.F. Sandfly Fever Commission. Their results were published in the *Journal* in December, 1933, under the title of "The Life-history and Bionomics of *Phlebotomus papatasii*."—I am, etc.,

London, W.1. J. J. CONYBEARE.

Oedema of Extremities at Sea

SIR,—I was interested to read Surg. Lieut. T. E. Barwell's letter on the above subject in your issue of July 17. When I was going out to South America after the last war on a trip via Panama, being very run down I indulged in the usual salt-water baths on board ship. I was much alarmed after a week of these daily baths to find my feet, ankles, and legs very much swollen and oedematous. I naturally examined my urine for albumin, but found it negative. I then began to wash myself with the basin of fresh water provided after the salt-water baths. Very shortly after this the oedema disappeared and never recurred. I drew the attention of the ship's doctor to this and he told me that he had often been consulted by passengers for the same symptoms, but he could give no explanation of the cause of the oedema. Knowing the action of a salt-free diet in reducing oedema I came to the conclusion that the effect of the salt-water baths was responsible for the oedema in my case. I used to take my bath before washing and shaving, and as the weather was very warm I did not dry my body after my bath, thinking that

the salt-water baths would in this way have a more tonic effect. In subsequent sea trips to South Africa, Ceylon, etc., I found many passengers complaining of similar symptoms, and told the ship surgeons to advise them to sponge themselves well with fresh water after their salt-water baths, and in every case this had the desired effect in curing the oedema.—I am, etc.,

Oban. DUNCAN MACDONALD, M.D., C.M.

H 11 for Cancer

SIR,—The account of the experimental work, conclusions, and implications published by Gye, Ludford, and Barlow in the *Journal* of July 17 may be misleading to some of your readers, and some comment is necessary. The essential part of the correspondence relating to this work is therefore appended, from which it will be seen that the experimental methods used by Gye and his co-workers failed to conform to the conditions laid down.

Imperial Cancer Research Fund,
Mill Hill, N.W.7.
March 30, 1943.

Dear Mr. Thompson,

We have carried our examination of your product called H 11 and of the improved copper-precipitated extract sufficiently far to be convinced that the preparations have no effect on the growth of malignant cells. Our experiments will be carried through to completion before we publish them, but in the meantime I should be greatly obliged if you would let me have any comments on our failure to substantiate your claims.—With kind regards, Yours sincerely,

W. E. GYE,
Director.

Hosa Research Laboratories,
Sunbury-on-Thames.
April 12, 1943.

Dear Dr. Gye,

I have your letter of the 8th instant. I am surprised and disappointed to note that you have failed to obtain inhibitory effects using H 11 extract

This work has been steadily developed over the last 12 years and some thousands of experiments in mice have been performed by various research workers (the data of which are available) demonstrating beyond all possible doubt the inhibitory action of the extract on the Twort carcinoma. On this basis it has been applied clinically, and evidence of its inhibitory action in the human subject has been produced by over 300 independent members of the medical profession.

As you know, you were asked to use the extract at the request of Sir Alfred Webb-Johnson, who suggested this procedure. I did not need to have its well-established inhibitory action tested for any other purpose, it being, I am glad to say, well beyond the experimental stage, and the proved inhibitory action on both carcinoma and sarcoma in the human being is now the chief matter on which concentration is being made.

Regarding your experiments, I would draw your attention to the following points:

(1) On the basis of your own figures that at least 24 experimental animals have been used, and that you administered the extract without interruption in the dosages stated, the amount of extract supplied to you was only sufficient for a maximum of 24 animals for 21 days. As you must know, this is an inadequate time period for the experiment, particularly in view of the focal reaction referred to in my letter of March 3. Moreover, on the same date I sent you as a guide to your work a graph showing the results obtained by us, which indicated the inhibition as marked by the 39th day. Your experiments should surely have been conducted for at least this time period.

(2) On March 17 a batch of H 11 which was copper-precipitated was sent to you and acknowledged by you on March 18. You wrote to me in a letter dated March 30 that you were convinced that the preparation had no effect on the growth of malignant cells. Thus you had reached this conclusion after the extract had been in your possession for a period not exceeding 12 days. You had therefore ignored my original statement in my letter of March 3 that "in the mouse tumour there is a steady increase in size up to about the 8th–12th day and this is particularly due to the focal reaction." Clearly no inhibitory results could possibly be shown within this time period, and yet at this point you stated you were convinced the extract had no action on malignant cells.

(3) You stated you have not used the Twort carcinoma, as in your opinion others are more suitable; and in your letter of March 30 you suggest I should comment on your failure to substantiate our claims. In my letter of March 3 I wrote, "Our experience so far as the use of the extract on animal tumours is concerned is restricted to the Twort carcinoma." Moreover, our published work on H 11 extract has related solely to the Twort carcinoma (*Med. Press and Circular*, April 23, 1941). It is obvious therefore that the experiments should have been conducted using the Twort carcinoma. It was, in fact, your predecessor who strongly recommended the tumour to me as the most suitable for this work, and certainly the correlation between the inhibitory effects on these tumours and on human carcinoma has fully justified its use.

(4) Having found, some time ago, one of the inhibitors in H 11 extract to be beta-indol-acetic acid, we have since then increased its concentration by the addition of the sodium salt. A number of independent observers have described the inhibitory action of this substance on somatic growth and malignant growth (carcinoma and sarcoma) in rats and mice. For instance, Tanaka and Tuboi (*Gann.*, 1940, **34**, 346), using the same tumour as you have been using—namely, carcinoma 63—stated that this compound distinctly retarded the growth of the tumours. Again, Robinson (*Anatomical Record*, 1940, **78**, No. 4, Supp., 80 (abstract No. 90)) obtained a similar result. We have been able to confirm the results of these and other workers using beta-indol-acetic acid and its compounds on Twort carcinoma. We surely have a right to assume that if the injections had been given regularly and for a sufficiently long period, according to instructions, equal results would have been obtained.

(5) You state that the injections were mostly intraperitoneal. In my letter of March 3 I stated: "We have found that 1 c.cm. of the extract intraperitoneally twice daily in mice bearing this tumour causes regression in the majority of the tumours"; and so we would naturally have expected you to have carried out the same method. The only method of injection which we have found to be satisfactory is by the intraperitoneal route, and your variable methods of injection may therefore have vitiated the whole experiment, particularly in view of the small number of animals used.

(6) You state that the injections were given without interruption. My knowledge would suggest that at least one group of injections were missed. On March 15 you wrote stating your supply was nearly exhausted, and the letter was received here on March 17. Your laboratories were immediately telephoned and we were informed that you were without any extract at all.

(7) As regards the tissue-culture work, the question is not whether H 11 extract inhibits tissue culture but what is the concentration at which it does not inhibit growth, owing to the concentration of total solids. Obviously any extract can be sufficiently diluted to produce no effect, and, conversely, in the case of an extract such as this, any concentration above a certain value will inhibit. To state that the extract had no inhibitory action *in vitro* would be meaningless.

Your experiments having failed to conform with the conditions for the use of H 11 extract as outlined in my letter of March 3, I am quite prepared, should you so desire, to let you have further supplies for you to use on Twort carcinomata within the conditions laid down, when there can be no question that inhibitory effects will be shown.

In the meantime, my invitation contained in my letter of Feb. 5 is still open, and if you can find time to visit our laboratories the whole of our data is open for your fullest inspection and investigation.—Kind regards, Yours sincerely,

J. H. THOMPSON,
Director of Research.

No further correspondence having been addressed to us by Dr. Gye we were quite unaware of the present communication made by him. Several new facts now emerge from it to which attention is drawn.

(1) The chart of tumours demonstrates a definite growth inhibition as a result of administration of H 11 extract when assessed by the formula given in a paper from the Royal Cancer Hospital (Free) by Boyland (*Biochem. J.*, 1940, **34**, 1196).

$$\text{Ratio: } \frac{\text{Growth rate during second and third weeks}}{\text{Growth rate during first week}}$$

Treated Tumours		*Control Tumours*	
1.	0.92	7.	1.5
2.	0.73	8.	1.7
3.	0.99	9.	1.9
4.	2.3	10.	0.8
5.	0.21	11.	15.0
6.	0.77	12.	Regressed

Tumour size used in these calculations is the square root of tumour area. This corresponds to the "average tumour diameter" used by Boyland. The figures show that during the second and third weeks the treated tumours grew at a slower rate than during the first week. The control tumours grew nearly twice as fast during the second two weeks as during the first week.

(2) Multiple tumours frequently grow at a rate considerably greater than that of single tumours—a rate we have often found to be more difficult to inhibit by the usual dosages of our extract. It is therefore surprising that Dr. Gye should draw far-reaching conclusions regarding the effect of an extract on experimental tumours when, of the twelve mice used, one carried a regressing

tumour while seven of the remainder had double tumours. Of the six *treated* animals five carried double tumours while the remaining double tumour was the most rapidly growing tumour in the control group. This was an unfortunate selection, but in these laboratories conclusions would not be deduced from an experiment in which the treated and control groups differed so greatly.

(3) The authors have assessed the health of the mice by weight, changing the method of or stopping injections when "the weight of a mouse began to drop"—whatever that ambiguous expression may mean. At this critical juncture the authors laid aside the prescribed method of injection. The soundness of this procedure when investigating growth inhibitors is open to grave doubt.

(4) No information has yet been obtained to indicate the correct dosage, method of administration, or period of time required to produce inhibitory effects on tumours in animals other than the Twort carcinoma. Incidentally, the statement that "intraperitoneal injection of 1 c.cm. twice daily becomes an ordeal for a 20-g. mouse" is absurd. In these laboratories during the last three years we have injected thousands of mice intraperitoneally with 1 c.cm. twice daily without ill effect. There is no indication that the control mice were injected with equivalent dosages of saline, as they should have been.

(5) In the tissue-culture tests 50% H 11 killed both normal and malignant cells. In 10% H 11 growth rates were equal. The authors fail to record the results with intermediate concentrations, if, indeed, they were tried.

The conclusion was thus reached that the extract had no specific inhibitory action on the growth of tumour cells; certainly no such claim has ever been made by these laboratories. Whatever theory of growth inhibition is held, such an inhibition need not necessarily be accompanied by a cessation of repair processes, as was suggested in your leading article. Our observations have not led us to conclude that there is any "inhibition of growth of skin and hair and of blood cells" when physiological inhibition is at its maximum—namely, following the not uncommon phenomenon of puberty. This fact has apparently been overlooked both by your leader writer and by Dr. Gye himself (*Lancet*, March 14, 1942).

The author of your leading article evidently appreciates our theoretical basis whilst Dr. Gye and his colleagues clearly fail to do so. Nevertheless, your leading article, accepting unreservedly the conclusions of Gye *et al.*, uses them as a criticism of our research. Perhaps the author of your leader should have studied the latter results more carefully, and Dr. Gye might well have investigated our data as he was invited to do.

The fact remains that the tissue-culture experiments did not have controls, since no cultures of normal and malignant cells without H 11 extract were made. Although Gye *et al.* thought it necessary to devote the first half of their article to a description of the care and control employed in their routine methods, yet the remainder of the communication is a demonstration of the failure to employ the necessary conditions laid down and to provide proper scientific controls.

As regards the heavily biased statements made in your leading article we would only at this stage refer to the following important factors:

1. The 51 cases treated at Kingston County Hospital are all described as "advanced . . . usually in poor health . . . with few exceptions they were cases in which operation or radium therapy was considered to be insufficient to eradicate the local disease." Bearing these facts in mind, we suggest a more careful study of the details of the cases presented.

2. Our evidence indicates that H 11 extract, whilst inhibiting growth, does not interfere with repair processes. It will be noted in this connexion that Case 26 is chosen rather than, say, Case 25 or Case 37, although both the latter, having received many more injections than Case 26, are therefore better examples of the argument put forward. But perhaps the writer of the leading article preferred to emphasize a case which, according to Kidd, did not respond to H 11 extract, rather than cases described by Kidd as now "N.A.D. . . . general condition very good, no symptoms, no signs of recurrence."

3. There is abundant clinical evidence in data at these laboratories fully substantiating the one and only claim made—namely, that H 11 extract does inhibit tumour growth. The data are open for any qualified persons to investigate, and full investigation has been repeatedly invited.

No claim of "cancer cure" has ever been made by us, although it is true that some cases of histologically proven carcinoma have completely recovered, all tumours having regressed. A comparatively short time period is sufficient to demonstrate the inhibitory effect, and the statement that "eighteen months is too short a time to reach a firm conclusion that a treatment is of value" is irrelevant. As regards the supposed "fallacy of correlating the growth of oat seedlings with the growth of cancer," attention is drawn to the fact that beta-indol-acetic acid, a known constituent of urine, is an inhibitor of the root growth of plants, somatic growth in animals (Robinson, *Anat. Rec.*, 1940, **78,** 166), and of carcinoma and sarcoma in animals (Tanaka and Tuboi, *Gann.*, 1940, **34,** 346; Robinson, *Anat. Rec.*, 1940, **78,** 80; and others).

The Hosa Research Laboratories operate under a registered charitable Trust and are thus debarred from making profit.—We are, etc.,

J. H. THOMPSON.
P. F. HOLT.
R. FORBES JONES.

Sunbury-on-Thames.

*** In view of the criticisms of Prof. W. E. Gye contained in the above letter we have thought it right to submit a copy of the letter to Prof. Gye so that his answer may appear parallel with it.—ED., *B.M.J.*

SIR,—We are obliged to the Editor for the opportunity of reading the communication of Mr. J. H. Thompson and his colleagues. To us the relevant fact is this: that malignant tumours of mice which we have treated with H 11 continued to grow and killed the mice at the same rate as our untreated controls. Our experiments therefore compel us to conclude that H 11 has no inhibitory action on malignant growth. So far as we are concerned no calculations, arguments, or complaints alter this fact.—We are, etc.,

W. E. GYE.
R. J. LUDFORD.

Imperial Cancer Research Fund, Mill Hill, N.W.7.

SIR,—The papers by the Imperial Cancer Research Fund workers and Mr. H. A. Kidd and your leading article in the *Journal* of July 17 are of great importance. I have no direct or indirect interest of any kind in Mr. J. H. Thompson's work, but have had the opportunity in the last three years of seeing something of it. I would, therefore, venture one or two comments.

Even the papers you publish seem to me hardly to justify the wholesale condemnation of your leader. Eleven of Mr. Kidd's cases (Nos. 4, 17, 20, 22, 25, 27, 29, 31, 37, 39, and 41) suggest that the exhibition of H 11 might have exercised some influence. Can further light be shed on this by the comparative analysis of a similar series of cases treated by palliative or radical surgery and/or radium? The experience of other clinicians who have used H 11 in the last two years would also be of value.

As you point out, Mr. Thompson emphasizes that orthodox methods of treatment should always be used where applicable: no vestige of a claim is made that at present H 11 is a comparable alternative. Whether it ever will be can only depend on observation of its effect on inoperable or recurrent cases, together with the usual laboratory investigations. Prof. Gye's work on this aspect of H 11 is obviously not encouraging, but Mr. Thompson will perhaps adduce his own work on the treatment of the Twort carcinoma in mice. In the meantime, H 11 cannot be said to militate against the proper treatment of any case of cancer.

Your own observation that H 11 should have some effect on the growth rate of skin and hair is eminently reasonable. Some facts on the rate of growth of the nails and hair in patients treated with H 11 as compared with the normal should not be difficult to secure.

Mr. Thompson is not the only worker to call attention to the presence of growth-inhibitory substances in urine, and, in fact, Mr. Kidd's paper includes references to some American work on this subject. It would be a great pity if views on the method of marketing H 11 (and there may be two sides to this aspect of the matter) prevented investigation of the existence and physiological properties of these growth-inhibitory substances. Their application to the treatment of cancer, however dramatic and whether it proves well founded or not, is only one aspect of the larger question. I hope that your articles will not inhibit interest in growth-inhibitors.—I am, etc.,

J. A. SCOTT.

Town Hall, Fulham.

Bran in the Diet

SIR,—By the introduction of roller milling and of white flour people have been robbed not only of the vitamins and mineral of wheat but of the natural means of moving their bowels. Hence the vast sale of unnatural means of purgation. The Russians work and fight with splendid energy on wholemeal bread and cabbage soup. The scientific advisers to the Ministry of Food have added to the war loaf, as they say, all that is digestible in wheat, but have left out of account the important natural purgative effect of bran. A finely milled whole-wheat loaf is much tastier than war bread; but the millers want us to go back to white bread after the war, and secure again the great profits made from milling—profits which have been made to the detriment of the people's health. The almost universal decay of teeth is one result, and a proper diet, not dentists, will remedy this.—I am, etc.,

Chalfont St. Peter. LEONARD HILL.

Shortened Puerperium

SIR,—I have read with much interest the letters upon this subject in your issues of May 22, June 5 and 19, and July 3 and 10. In this correspondence too little reference has been made to the interests of the children concerned. The younger children, no less than the elder, of a family require nine months' abundant breast-milk feeding given by an unfatigued mother. This feeding is best secured, as family medical histories suggest, by a four-weeks puerperium with subsequent domestic help for the mother.

Often to-day, of necessity, the "monthly nurse," succeeded by the "nurse to take the baby from the month," must be replaced by a three-weeks stay in a nursing-home (followed by the kindly domestic help of friends) for the mother. Many doctors, I feel, would gladly further a plan, if formulated, by which a four-weeks puerperium could be secured to the average mother so that her infant might the better thrive. The financial cost entailed could well be defrayed by the money mistakenly spent in supplying non-breast-milk and bottles to infants, while attempting the restoration to health of their unrested mothers.—I am, etc.,

HELEN YOUNG.

SIR,—I have been interested as a medical woman in the correspondence about shorter puerperium.

After observing the activity of many African women as early as the day of delivery and the absence of ill effects, it seemed to me reasonable to have a shorter puerperium than the generally approved ten days. After the birth of my first child I got up for a short time on the third and on each succeeding day. There was considerable perineal discomfort, which persisted for at least a month. There had been a second-degree tear and some local sepsis in the wound.

After the second child, two years later, when there was no tear, I got up from the second day onwards for hot baths (at 100° F.) and exercises of chest and abdominal muscles, and gradually progressed from a walk round the room on the 2nd to a routine of easy activity on the 10th day. Fitness at this stage was certainly beyond what one had observed among patients during a term as resident in a maternity hospital. The same procedure was followed after the third confinement, also with excellent effect. On no occasion was there any rise in daily P.T.R. readings.

The conclusion I think is that the symptoms of the patient are a safe guide, that there should never be any feeling of strain, but that, after an uncomplicated delivery, early baths and exercise short of producing fatigue are valuable in restoring muscle tone, regulating milk supply, and avoiding the usual weakness resulting from a longer period of recumbency.—I am, etc.,

Beverley, Yorks. ADÈLE NYE, M.B., CH.B.

Obstetrical Forceps for Fibroid

SIR,—On reading the interesting memorandum by Mr. John Stallworthy under this heading (July 10, p. 41) I was reminded of a similar case which occurred in my practice in Midlothian forty years ago.

A coal-miner's wife aged 46 was seen by me as she was having uterine haemorrhage. The bleeding had come on a few days previously, and was not excessive. The history was that there had been similar attacks, occurring at irregular intervals, each lasting for three or four days, for about four months. She had been an in-patient at a hospital for the same symptom some months before I saw her.

The patient was of good physique but very pale and anaemic. The uterus was the size and shape of a 3½-months pregnancy, but there were no corroborative signs of this condition. Per vaginam the os uteri was an inch in diameter, and protruding through it was a lobulated mass, much firmer and more fibrous than a placenta. The diagnosis was a submucous fibroid in process of extrusion.

Liquid extract of ergot m xxx t.i.d. was prescribed and antiseptic douches ordered. The haemorrhage stopped and did not return. In a few days the mass protruded fully an inch beyond the os. At the end of ten days the mass had descended to within an inch of the vulva, and the cervix could no longer be felt. During this period an offensive discharge was present, with occasional slight rise of temperature, and there were other indications of toxaemia—namely, an ashy-grey colour of the face, and the pulse was quicker than normal and of small volume.

As at the end of this time the patient's condition was not good, chiefly because of toxaemia due to want of drainage of the uterine cavity, it was obvious that the tumour must be removed. She was given two ounces of whisky to drink instead of an anaesthetic, put into the left lateral obstetric position, and Milne Murray's axis traction forceps were applied to the tumour (which fitted them neatly). Moderate traction failed to bring it down, so the forceps were rotated through three-quarters of a circle in order to tear through the pedicle. The whole tumour then came out quite easily with very little haemorrhage. A strip of gauze also came out with the tumour, this having probably been left in the uterus from some previous plugging for haemorrhage.

The tumour had undergone fatty degeneration in parts, and was slightly smaller than a baby's head. The attachment to the fundus uteri was flat and about nine square inches in area. No other fibroids were present. The patient made a good recovery.

—I am, etc.,

Bridgwater. JOHN H. AYTOUN, M.D., C.M.

The Cult of Negative Health

SIR,—I am indebted to Dr. Pegge for pointing out that my letter of June 19 might be used as an argument against social planning. I imagine that Dr. Pegge had in mind the possibility of its being suggested that I had advocated *any* kind of work, however boring and fruitless, as a means of avoiding mental ill-health. This was certainly not my intention. The factory hand on a routine job and the working-class mother whose only tap and sink are at the end of the court necessarily have most of their energy used up on a few monotonous activities, but this is emphatically not an environmental situation which demands or even gives opportunity for the use of all their "interests and abilities" as distinct from sheer physical strength. Moreover, this extreme canalization of activity into repetitive tasks inevitably encourages and increases man's lack of awareness of his powers, while at the same time giving him very good grounds for believing that "work" is invariably distasteful and dull. Where the environment stimulates activities, forgotten or unknown powers and interests are discovered. The man of all-round training who has enjoyed the use of many and varied abilities *may* continue to seek means of employing them under restricted conditions. Where, however, there is a lack both of environmental stimulation and of self-knowledge it is obviously impossible for the individual to get out of the rut unaided. It is this situation which, as Dr. Pegge says, calls for social planning applied to the whole field of human activity.

Nevertheless, at the risk of confusing matters, I feel obliged to say that, if we are to believe our patients, it would seem that any work is better than none. In support of this, I would like to quote an intelligent young woman seen in consultation since my last letter. She has been ill for over two years with acute fears concerning her own body. She has always been physically healthy and has had no previous breakdown.

"I had been a weaver for five years and I had worked my way up until I was weaving worsteds. But I found that was very easy work. The machines look after themselves. I didn't like that. I got very self-conscious—with an idle mind. So I got out of it and went into war work. But *no* work came in. We had nothing to do for five months. I didn't get my cure—hard work. We had to sit by the machines all day, not reading or knitting. We mustn't

tumour while seven of the remainder had double tumours. Of the six *treated* animals five carried double tumours while the remaining double tumour was the most rapidly growing tumour in the control group. This was an unfortunate selection, but in these laboratories conclusions would not be deduced from an experiment in which the treated and control groups differed so greatly.

(3) The authors have assessed the health of the mice by weight, changing the method of or stopping injections when "the weight of a mouse began to drop"—whatever that ambiguous expression may mean. At this critical juncture the authors laid aside the prescribed method of injection. The soundness of this procedure when investigating growth inhibitors is open to grave doubt.

(4) No information has yet been obtained to indicate the correct dosage, method of administration, or period of time required to produce inhibitory effects on tumours in animals other than the Twort carcinoma. Incidentally, the statement that "intraperitoneal injection of 1 c.cm. twice daily becomes an ordeal for a 20-g. mouse" is absurd. In these laboratories during the last three years we have injected thousands of mice intraperitoneally with 1 c.cm. twice daily without ill effect. There is no indication that the control mice were injected with equivalent dosages of saline, as they should have been.

(5) In the tissue-culture tests 50% H 11 killed both normal and malignant cells. In 10% H 11 growth rates were equal. The authors fail to record the results with intermediate concentrations, if, indeed, they were tried.

The conclusion was thus reached that the extract had no specific inhibitory action on the growth of tumour cells; certainly no such claim has ever been made by these laboratories. Whatever theory of growth inhibition is held, such an inhibition need not necessarily be accompanied by a cessation of repair processes, as was suggested in your leading article. Our observations have not led us to conclude that there is any "inhibition of growth of skin and hair and of blood cells" when physiological inhibition is at its maximum—namely, following the not uncommon phenomenon of puberty. This fact has apparently been overlooked both by your leader writer and by Dr. Gye himself (*Lancet*, March 14, 1942).

The author of your leading article evidently appreciates our theoretical basis whilst Dr. Gye and his colleagues clearly fail to do so. Nevertheless, your leading article, accepting unreservedly the conclusions of Gye *et al.*, uses them as a criticism of our research. Perhaps the author of your leader should have studied the latter results more carefully, and Dr. Gye might well have investigated our data as he was invited to do.

The fact remains that the tissue-culture experiments did not have controls, since no cultures of normal and malignant cells without H 11 extract were made. Although Gye *et al.* thought it necessary to devote the first half of their article to a description of the care and control employed in their routine methods, yet the remainder of the communication is a demonstration of the failure to employ the necessary conditions laid down and to provide proper scientific controls.

As regards the heavily biased statements made in your leading article we would only at this stage refer to the following important factors:

1. The 51 cases treated at Kingston County Hospital are all described as "advanced . . . usually in poor health . . . with few exceptions they were cases in which operation or radium therapy was considered to be insufficient to eradicate the local disease." Bearing these facts in mind, we suggest a more careful study of the details of the cases presented.

2. Our evidence indicates that H 11 extract, whilst inhibiting growth, does not interfere with repair processes. It will be noted in this connexion that Case 26 is chosen rather than, say, Case 25 or Case 37, although both the latter, having received many more injections than Case 26, are therefore better examples of the argument put forward. But perhaps the writer of the leading article preferred to emphasize a case which, according to Kidd, did not respond to H 11 extract, rather than cases described by Kidd as now "N.A.D. . . . general condition very good, no symptoms, no signs of recurrence."

3. There is abundant clinical evidence in data at these laboratories fully substantiating the one and only claim made—namely, that H 11 extract does inhibit tumour growth. The data are open for any qualified persons to investigate, and full investigation has been repeatedly invited.

No claim of "cancer cure" has ever been made by us, although it is true that some cases of histologically proven carcinoma have completely recovered, all tumours having regressed. A comparatively short time period is sufficient to demonstrate the inhibitory effect, and the statement that "eighteen months is too short a time to reach a firm conclusion that a treatment is of value" is irrelevant. As regards the supposed "fallacy of correlating the growth of oat seedlings with the growth of cancer," attention is drawn to the fact that beta-indol-acetic acid, a known constituent of urine, is an inhibitor of the root growth of plants, somatic growth in animals (Robinson, *Anat. Rec.*, 1940, **78,** 166), and of carcinoma and sarcoma in animals (Tanaka and Tuboi, *Gann.*, 1940, **34,** 346; Robinson, *Anat. Rec.*, 1940, **78,** 80; and others).

The Hosa Research Laboratories operate under a registered charitable Trust and are thus debarred from making profit.—We are, etc.,

J. H. THOMPSON.
P. F. HOLT.
R. FORBES JONES.

Sunbury-on-Thames.

*** In view of the criticisms of Prof. W. E. Gye contained in the above letter we have thought it right to submit a copy of the letter to Prof. Gye so that his answer may appear parallel with it.—ED., *B.M.J.*

SIR,—We are obliged to the Editor for the opportunity of reading the communication of Mr. J. H. Thompson and his colleagues. To us the relevant fact is this: that malignant tumours of mice which we have treated with H 11 continued to grow and killed the mice at the same rate as our untreated controls. Our experiments therefore compel us to conclude that H 11 has no inhibitory action on malignant growth. So far as we are concerned no calculations, arguments, or complaints alter this fact.—We are, etc.,

W. E. GYE.
R. J. LUDFORD.

Imperial Cancer Research Fund,
Mill Hill, N.W.7.

SIR,—The papers by the Imperial Cancer Research Fund workers and Mr. H. A. Kidd and your leading article in the *Journal* of July 17 are of great importance. I have no direct or indirect interest of any kind in Mr. J. H. Thompson's work, but have had the opportunity in the last three years of seeing something of it. I would, therefore, venture one or two comments.

Even the papers you publish seem to me hardly to justify the wholesale condemnation of your leader. Eleven of Mr. Kidd's cases (Nos. 4, 17, 20, 22, 25, 27, 29, 31, 37, 39, and 41) suggest that the exhibition of H 11 might have exercised some influence. Can further light be shed on this by the comparative analysis of a similar series of cases treated by palliative or radical surgery and/or radium? The experience of other clinicians who have used H 11 in the last two years would also be of value.

As you point out, Mr. Thompson emphasizes that orthodox methods of treatment should always be used where applicable; no vestige of a claim is made that at present H 11 is a comparable alternative. Whether it ever will be can only depend on observation of its effect on inoperable or recurrent cases, together with the usual laboratory investigations. Prof. Gye's work on this aspect of H 11 is obviously not encouraging, but Mr. Thompson will perhaps adduce his own work on the treatment of the Twort carcinoma in mice. In the meantime, H 11 cannot be said to militate against the proper treatment of any case of cancer.

Your own observation that H 11 should have some effect on the growth rate of skin and hair is eminently reasonable. Some facts on the rate of growth of the nails and hair in patients treated with H 11 as compared with the normal should not be difficult to secure.

Mr. Thompson is not the only worker to call attention to the presence of growth-inhibitory substances in urine, and, in fact, Mr. Kidd's paper includes references to some American work on this subject. It would be a great pity if views on the method of marketing H 11 (and there may be two sides to this aspect of the matter) prevented investigation of the existence and physiological properties of these growth-inhibitory substances. Their application to the treatment of cancer, however dramatic and whether it proves well founded or not, is only one aspect of the larger question. I hope that your articles will not inhibit interest in growth-inhibitors.—I am, etc.,

J. A. SCOTT.

Town Hall, Fulham.

Bran in the Diet

SIR,—By the introduction of roller milling and of white flour people have been robbed not only of the vitamins and mineral of wheat but of the natural means of moving their bowels. Hence the vast sale of unnatural means of purgation. The Russians work and fight with splendid energy on wholemeal bread and cabbage soup. The scientific advisers to the Ministry of Food have added to the war loaf, as they say, all that is digestible in wheat, but have left out of account the important natural purgative effect of bran. A finely milled whole-wheat loaf is much tastier than war bread; but the millers want us to go back to white bread after the war, and secure again the great profits made from milling—profits which have been made to the detriment of the people's health. The almost universal decay of teeth is one result, and a proper diet, not dentists, will remedy this.—I am, etc.,

Chalfont St. Peter. LEONARD HILL.

Shortened Puerperium

SIR,—I have read with much interest the letters upon this subject in your issues of May 22, June 5 and 19, and July 3 and 10. In this correspondence too little reference has been made to the interests of the children concerned. The younger children, no less than the elder, of a family require nine months' abundant breast-milk feeding given by an unfatigued mother. This feeding is best secured, as family medical histories suggest, by a four-weeks puerperium with subsequent domestic help for the mother.

Often to-day, of necessity, the "monthly nurse," succeeded by the "nurse to take the baby from the month," must be replaced by a three-weeks stay in a nursing-home (followed by the kindly domestic help of friends) for the mother. Many doctors, I feel, would gladly further a plan, if formulated, by which a four-weeks puerperium could be secured to the average mother so that her infant might the better thrive. The financial cost entailed could well be defrayed by the money mistakenly spent in supplying non-breast-milk and bottles to infants, while attempting the restoration to health of their unrested mothers.—I am, etc.,

HELEN YOUNG.

SIR,—I have been interested as a medical woman in the correspondence about shorter puerperium.

After observing the activity of many African women as early as the day of delivery and the absence of ill effects, it seemed to me reasonable to have a shorter puerperium than the generally approved ten days. After the birth of my first child I got up for a short time on the third and on each succeeding day. There was considerable perineal discomfort, which persisted for at least a month. There had been a second-degree tear and some local sepsis in the wound.

After the second child, two years later, when there was no tear, I got up from the second day onwards for hot baths (at 100° F.) and exercises of chest and abdominal muscles, and gradually progressed from a walk round the room on the 2nd to a routine of easy activity on the 10th day. Fitness at this stage was certainly beyond what one had observed among patients during a term as resident in a maternity hospital. The same procedure was followed after the third confinement, also with excellent effect. On no occasion was there any rise in daily P.T.R. readings.

The conclusion I think is that the symptoms of the patient are a safe guide, that there should never be any feeling of strain, but that, after an uncomplicated delivery, early baths and exercise short of producing fatigue are valuable in restoring muscle tone, regulating milk supply, and avoiding the usual weakness resulting from a longer period of recumbency.—I am, etc.,

Beverley, Yorks. ADÈLE NYE, M.B., CH.B.

Obstetrical Forceps for Fibroid

SIR,—On reading the interesting memorandum by Mr. John Stallworthy under this heading (July 10, p. 41) I was reminded of a similar case which occurred in my practice in Midlothian forty years ago.

A coal-miner's wife aged 46 was seen by me as she was having uterine haemorrhage. The bleeding had come on a few days previously, and was not excessive. The history was that there had been similar attacks, occurring at irregular intervals, each lasting for three or four days, for about four months. She had been an in-patient at a hospital for the same symptom some months before I saw her.

The patient was of good physique but very pale and anaemic. The uterus was the size and shape of a 3½-months pregnancy, but there were no corroborative signs of this condition. Per vaginam the os uteri was an inch in diameter, and protruding through it was a lobulated mass, much firmer and more fibrous than a placenta. The diagnosis was a submucous fibroid in process of extrusion.

Liquid extract of ergot ℥ xxx t.i.d. was prescribed and antiseptic douches ordered. The haemorrhage stopped and did not return. In a few days the mass protruded fully an inch beyond the os. At the end of ten days the mass had descended to within an inch of the vulva, and the cervix could no longer be felt. During this period an offensive discharge was present, with occasional slight rise of temperature, and there were other indications of toxaemia—namely, an ashy-grey colour of the face, and the pulse was quicker than normal and of small volume.

As at the end of this time the patient's condition was not good, chiefly because of toxaemia due to want of drainage of the uterine cavity, it was obvious that the tumour must be removed. She was given two ounces of whisky to drink instead of an anaesthetic, put into the left lateral obstetric position, and Milne Murray's axis traction forceps were applied to the tumour (which fitted them neatly). Moderate traction failed to bring it down, so the forceps were rotated through three-quarters of a circle in order to tear through the pedicle. The whole tumour then came out quite easily with very little haemorrhage. A strip of gauze also came out with the tumour, this having probably been left in the uterus from some previous plugging for haemorrhage.

The tumour had undergone fatty degeneration in parts, and was slightly smaller than a baby's head. The attachment to the fundus uteri was flat and about nine square inches in area. No other fibroids were present. The patient made a good recovery.

—I am, etc.,

Bridgwater. JOHN H. AYTOUN, M.D., C.M.

The Cult of Negative Health

SIR,—I am indebted to Dr. Pegge for pointing out that my letter of June 19 might be used as an argument against social planning. I imagine that Dr. Pegge had in mind the possibility of its being suggested that I had advocated *any* kind of work, however boring and fruitless, as a means of avoiding mental ill-health. This was certainly not my intention. The factory hand on a routine job and the working-class mother whose only tap and sink are at the end of the court necessarily have most of their energy used up on a few monotonous activities, but this is emphatically not an environmental situation which demands or even gives opportunity for the use of all their "interests and abilities" as distinct from sheer physical strength. Moreover, this extreme canalization of activity into repetitive tasks inevitably encourages and increases man's lack of awareness of his powers, while at the same time giving him very good grounds for believing that "work" is invariably distasteful and dull. Where the environment stimulates activities, forgotten or unknown powers and interests are discovered. The man of all-round training who has enjoyed the use of many and varied abilities *may* continue to seek means of employing them under restricted conditions. Where, however, there is a lack both of environmental stimulation and of self-knowledge it is obviously impossible for the individual to get out of the rut unaided. It is this situation which, as Dr. Pegge says, calls for social planning applied to the whole field of human activity.

Nevertheless, at the risk of confusing matters, I feel obliged to say that, if we are to believe our patients, it would seem that any work is better than none. In support of this, I would like to quote an intelligent young woman seen in consultation since my last letter. She has been ill for over two years with acute fears concerning her own body. She has always been physically healthy and has had no previous breakdown.

"I had been a weaver for five years and I had worked my way up until I was weaving worsteds. But I found that was very easy work. The machines look after themselves. I didn't like that. I got very self-conscious—with an idle mind. So I got out of it and went into war work. But *no* work came in. We had nothing to do for five months. I didn't get my cure—hard work. We had to sit by the machines all day, not reading or knitting. We mustn't

do anything, because, when the manager came in, he had to see that we were willing to work. Then I couldn't eat or sleep and broke down. I've a lot of energy and I ought to be kept occupied."

One could hardly have a better description of the ills wrought by over-investment of energy within the individual owing to refusal of the environment to permit any outlet. The grim irony of a situation in which readiness to work is judged by willingness to remain idle was, I may add, quite unrecognized by the patient.

The thoughtful contributions of Dr. Maberly and Dr. Eates have opened up the subject considerably. Dr. Maberly's comment on the increase of hypochondria and anxiety states during a period in which physical health and economic security have improved is entirely in line with Lord Geddes's observations and my own. It comes to this: although we should like to think that we are rational beings, influenced in our feelings, judgments, and beliefs only by present external reality, this is not and never has been so. No measure of physical or economic security bestowed upon us from without can give us the experience of happiness, well-being, and confidence which is to be gained by the full use of our own powers. That Dr. Eates considers that my "thesis deserves the closest attention" is, I suggest, an unintentional but grim indictment of our present outlook, since, far from being original, it is at least as old as our era. In my humble opinion the parable of the talents (St. Matthew, ch. 25, vv. 14–30) presents, with the utmost precision and detail, this entire problem. But how, in the present complexity of our civilization, shall we find a solution?—I am, etc.,

London, N.W.3. R. E. LUCAS.

SIR,—I am in complete accord with the letters of Dr. R. E. Lucas (June 19, p. 766) and Dr. A. R. Eates (July 10, p. 55). I am particularly impressed by Dr. Eates's reference to "the disastrous effects upon the health of both body and mind of women who have practised contraception and the severe limitation of the family," and his statement that in his experience the most healthful women have been those with large families. With 50 years' experience behind him he will have no difficulty in proving the truth of this statement. Can Lord Dawson, Lord Horder, and the Family Planning Association as easily prove the contrary?—I am, etc.,

JANE SCOTT CALDER.

Treatment of Venereal Diseases

SIR,—As a venereologist likewise appalled by the way patients are being mistreated in general practice I found Brig. T. E. Osmond's article on the modern treatment of gonorrhoea (July 17, p. 72) very interesting reading. My experience is that the majority of these patients are treated by the medical practitioner unskilled in the treatment of venereal disease. His main aim is the acquiring of large fees, which he can both demand and get from uneasy patients by supplying the initial treatment in the easily administered sulphonamide group of drugs.

The average practitioner is without most of the expensive equipment such as incubator, urethroscope, etc., required for tests of cure; furthermore, after the cessation of urethral discharge he has neither the time nor the interest to carry out final tests of cure, and the patient is discharged under the impression that a cure has been effected. The time has arrived for some form of legislation to prevent medical men who have not obtained recognized postgraduate experience from treating venereal diseases.—I am, etc.,

IAN MCLACHLAN,
Scunthorpe, Lincs. Medical Officer of Health and Venereal Diseases Officer.

Symptomatology of Malaria

SIR,—Since you kindly published my letter on the above subject (July 17, p. 86) I have discovered that the classification of the types of malaria used in hospital was drawn up by Sir Philip Manson-Bahr in his official Army instruction pamphlet for the guidance of medical officers. The classification proved so valuable that its author should be known.—I am, etc.,

Eastry, Kent. D. M. M. FRASER.

Practice and Precept

SIR,—According to Dr. Charles Hill (*Journal*, May 22) the Minister of Health proposed that general practice should be conducted on a salaried basis. According to the *Manchester Guardian* (July 13), the Minister of Health as leader of the Liberal National Party, addressing the Post-war Policy Committee, said: "I must make it abundantly clear that we attach the utmost importance to a concerted and effective attempt to give free enterprise and initiative full play in the broad sweep of all our national plans."—I am, etc.,

S. WRAY.

Whole-time Security

SIR,—Your editorial on the forthcoming White Paper advocates a background of security for the whole-time research worker, and, quite rightly, postulates that this essential security depends on the research worker living on a whole-time salary. It is equally imperative that the general practitioner has a background of security—a security lacking now, a security only possible if the G.P., like the research worker, lives on a whole-time salary.—I am, etc.,

MERVYN ABRAHAMSON.

Health Centres

SIR,—It is probable that a majority of general practitioners are opposed to the provision of these centres, but I find a few of our colleagues have failed to consider all the implications. Some regard the centres as a convenient sop to Cerberus—a minimal concession to a general ill-defined desire for change. Perhaps in others there is a hint of petticoat government. Our wives would naturally welcome separation of the practice from the household. The prestige of the Peckham experiment may influence some—though this brilliant investigation in social biology was surely never intended as a blueprint for medical practice. More regular hours of duty and holidays without the worry of a locum must also be allowed their attraction. May I beg those who have been influenced by these or other considerations to allow:

First, the tremendous cost of building, equipping, and maintaining the centres (about 2,500 of them in the whole country on a basis of 10 doctors per centre and about 2,000 patients per doctor)—plus the wasteful duplication of pathological, radiological, and other specialist services as between the centres and the local hospital.

Secondly, that no matter what the initial arrangement may be, these centres will be bound eventually to bring us partly or wholly within local government provisions—surely it would be found in practice that the only competent authority for staffing, maintenance, and finance would be the local council. And this more logically since it is obviously intended that we should discharge some part of the responsibilities of the medical officer of health—particularly in regard to maternity and child welfare, though I am sure that few of us would be willing or qualified to undertake the work and do it efficiently.

Thirdly, that the provision of the centres would mean the end of general practice as we have known it. Until the inevitable collapse of the centralization policy there would be no man among the welter of specialists, medical officers, and administrators whose job would be to know the whole patient in relation to his whole environment—a fact of great significance in the present state of medical knowledge, wherein some attempt at integration of scientific findings within their sociological and philosophical background would surely prove most fruitful for future advance. It will be argued that this is too dismal a view of results, but I am personally convinced that it would work out so in practice. Mrs. A would in the first case attend her own doctor at the centre—granted. But on her return visit for observation of progress she would find unfortunately she had picked her own doctor's day off. She would see Dr. B, who might advise some further investigation. At a subsequent visit she would find her own doctor was now absent on a compulsory refresher course (*pace* B.M.A. and the Interdepartmental Committee on Medical Schools) and Dr. B on holiday, so Dr. C would have to start from scratch. Later perhaps her doctor would be "posted" to another centre—and so on and on.

Lastly, should we not consider the convenience of our patients? Which of our patients would not rather go round the corner and see Dr. Jones at his morning surgery and be back in time to see to the family's lunch, rather than dress up to go down town to the centre and be sorted out like sheep into the appropriate pen?—I am, etc.,

JOHN R. M. SANGSTER,
Capt., R.A.M.C.

Obituary

C. J. S. THOMPSON, M.B.E., PH.D.

Mr. C. J. S. Thompson, who died on July 14, was born at Liverpool on Aug. 27, 1862. Educated at Liverpool University, he devoted his early days to the study and practice of chemistry and pharmacy, with a special interest in the history of both these sciences. In 1909 he was appointed Curator of the projected Wellcome Historical Medical Museum and came to London to take up his duties. From that date until his retirement in 1926 he threw all his energy into gathering together and organizing the unrivalled collection housed at that time in Wigmore Street, W. In the course of arranging many noteworthy acquisitions he travelled extensively in Europe.

During the last war Thompson raised and trained two voluntary aid detachments of the British Red Cross Society, and established the "Holmleigh" Auxiliary Military Hospital, Harrow, of which he became the commandant. Many hundreds of British wounded passed through the hospital, and on its closing in 1919 Thompson was awarded the M.B.E. for his services. In 1927 the Royal College of Surgeons of England elected him honorary curator of the Historical Section of its Museum in Lincoln's Inn Fields, and in this position he worked untiringly until the collection was almost completely destroyed by enemy action in May, 1941. Fortunately Thompson had by that time finished his work on the *History and Evolution of Surgical Instruments* (New York, 1942), which placed on permanent record some of the Museum's most important exhibits.

The outcome of a life-long study of toxicology, C. J. S. Thompson's *Poisons and Poisoners* (1931) is a standard reference work. Outstanding among many other literary excursions into the byways of medicine, chemistry, and pharmacy was *The Art of the Apothecary* (1929). Already a member of the Royal Society of Medicine, Thompson became in 1936 a Commander of the Order of the Hospital of St. John of Jerusalem. For his researches in the history of medicine he was also elected an Associate of the Royal Academy of Medicine, Turin.

Dr. INEZ MEYER (Mrs. Struckman) died suddenly at her home in West Wimbledon on June 5. She was a student of the London School of Medicine for Women and the Royal Free Hospital, qualifying M.R.C.S., L.R.C.P. in 1926 and later graduating M.B., B.S.Lond. After holding several resident appointments she started in practice in West Wimbledon and still continued at intervals to help in hospital clinical work. In both hospital and private practice her keen interest in all branches of medicine, her sympathetic understanding and friendly cheerful personality were greatly appreciated by her patients and her colleagues, who mourn the loss of an excellent doctor and a valued friend. She was a devoted wife and mother, and to her husband and two young daughters our deepest sympathy is extended.—E. M. H.

The death took place at Reading on June 30 of Dr. CAMPBELL HIGHET, late of Ayr, aged 75. After graduating M.B., C.M. at Glasgow in 1892 he started general practice at Cardonald, later moving south to Wisbech, Worcester, and Reading, where he had practised for the past 28 years. For many years Dr. Highet lectured and examined in first aid and home nursing for the St. Andrews Ambulance Association, the St. John Ambulance Association, and the British Red Cross Society.

Mr. HUGH WRIGHT THOMSON, consulting ophthalmic surgeon to the Glasgow Royal Infirmary and Ophthalmic Institution, died on June 16. He was born in Glasgow in 1873, and from Allan Glen's School went on to study medicine at the University, graduating M.B., C.M. in 1895. He proceeded M.D. seven years later, after holding a number of house appointments at the Royal Infirmary and Glasgow Eye Infirmary. Mr. Wright Thomson had a distinguished military record during the last war, serving in Gallipoli, Egypt, Palestine, France, and Belgium as lieut.-col., R.A.M.C.(T.), in command of the Lowland Mounted Brigade Field Ambulance. His services were recognized by the award of the D.S.O. and the Territorial Decoration, and the Order of the Nile, 3rd Class. On returning to civil life he was appointed ophthalmic surgeon to the Bellahouston Hospital under the Ministry of Pensions and medical referee for ophthalmic cases in the Sheriffdom of Lanarkshire; and was also for a time senior oculist to the Glasgow Education Health Service. He had been a member of the B.M.A. for the past 45 years.

Dr. WILLIAM ELMSLIE HENDERSON, of Carlton Place, Aberdeen, died on June 26, aged 71. He studied medicine at Aberdeen, Edinburgh, and Dublin, after graduating M.A. of Aberdeen University in 1893, and took the M.B., Ch.B.Aberd. in 1898 and the D.P.H. of Manchester University in 1911. Before entering the Public Health Service Dr. Henderson had been resident house-surgeon at the Aberdeen Royal Infirmary and surgeon to Kirkcaldy Hospital. He was for some time M.O.H. and school medical officer for the County of Westmorland, and published articles on epidemic poliomyelitis in *Public Health* and on Westmorland school children in the *Caledonian Medical Journal*. In recent years he had served as temporary assistant county M.O.H. for the Lindsey part of Lincolnshire and lived at Horncastle. He joined the B.M.A. in 1898.

We regret to learn from Trinidad of the death of Dr. EDGAR NICHOLAS DARWENT, a very old member of the British Medical Association. Born in 1864, he studied medicine at the University of Edinburgh and graduated M.D. in 1887. In Trinidad he held the posts of resident surgeon at the two hospitals, and after retiring from the Government service had a consulting practice in Port of Spain, from which he retired owing to failing health four years ago. Dr. Darwent was the first chairman of the Northern Division of the local branch of the B.M.A.

Universities and Colleges

UNIVERSITY OF OXFORD

In the Sheldonian Theatre on July 24 a ceremony was held for the second conferment of the degree of M.U.Dr. upon Czechoslovak medical students who have completed their studies in England and passed the special qualifying examination conducted by the Examining Board in England of the Royal Colleges of Physicians and Surgeons. The degrees were conferred by the Vice-Chancellor, the Regius Professor of Medicine, and the Nuffield Professor of Therapeutics in the University of Oxford, which is acting as sponsor for those Czechoslovak universities which are closed under the German occupation.

UNIVERSITY OF EDINBURGH

A graduation ceremony was held on July 14, when the following degrees and diplomas were conferred:

M.D.—Surg. Lieuts. [2]J. M. Crawford and [1]E. L. Thomson, R.N.V.R.
M.B., CH.B.—T. M. Abbas, T. L. Adamson, W. R. M. Alexander, R. P. Anderson, Catherine O. Bell, W. J. Bell, G. S. P. Birtwisle, J. A. P. Bouton, D. C. Boyd, Janet Braid, J. S. Brown, S. Campbell, J. A. Caskey, Jessica B. Core, C. M. Cornforth, B. Cruickshank, I. M. Cuthill, J. A. Dick, R. W. Draper, G. R. H. Drew, T. B. M. Durie, J. C. Edgar, R. Elliott, Constance M. Evans, Ida M. K. Fenton, Mary G. Findlay, J. B. Gibson, G. T. Goodall, Jessie R. Gray, Sarah K. R. Gray, H. MacK. Guthrie, R. D. Guy, R. R. Hamilton, H. C. Hastings, Lorna H. Heslop, Miriam H. Heughan, Elizabeth M. Hislop, D. R. Hughes, D. Hutchison, D. G. Illingworth, W. H. Isles, Isla M. S. Jamieson, J. C. Johnson, Kirsty M'F. Johnstone (*née* Barker), A. H. D. Large, J. H. Lawson, Doreen S. Leith-Ross, Audrey B. Lornie, W. M. M. Lyon, Margaret MacDonald, H. A. M'Dougle, Margaret M. M'Intosh, A. M. MacLachlainn, A. M. Macleod, A. T. Macqueen, D. J. L. McWatt, J. G. Martin, T. S. Matheson, M. Mendick, R. C. Milne, Patricia E. Mitchell, R. A. H. Morison, J. A. Morton, Agnes P. Muir, W. D. Munro, W. Murdie, Janet T. Murdoch, G. H. Pearson, J. J. Pepper, Margaret G. Proudfoot, R. J. G. Rattrie, Monica M. Renner, Dorothy C. G. M. Reside, C. Riley, G. I. Robertson, D. W. Robinson, J. Ross, D. Savory, D. I. H. Smith, J. G. Sommerville, R. J. C. Southern, Sheena G. D. P. Splitt, Sheila M. Stark, Isabel F. Sutherland, M. Tait, H. B. Taylor, G. H. M. Thornton, A. R. Watson, R. W. Watson, Margaret Watt, Elizabeth G. Watts, T. B. Whiston, J. B. Wilson, L. A. Wilson, Olive Wilson (*née* MacMillan), Robert D. Young.
B.SC.—Margaret G. Proudfoot, M.B., Ch.B.
D.P.H.—J. B. Brown, [2]O. H. Siung.

[1] Commended for thesis. [2] *In absentia.*

The following prizes were presented:

Ettles Scholarship and Leslie Medal, Keith Memorial Prize in Systematic Surgery, and Beaney Prize in Anatomy and Surgery: H. T. G. Strawbridge. *Scottish Association for Medical Education of Women Prize, Dorothy Gilfillan Memorial Prize, and Murdoch Brown Medal in Clinical Medicine:* Elizabeth M. Hislop. *Mouat Scholarship in the Practice of Physic:* W. Murdie. *Buchanan Scholarship in Midwifery and Gynaecology:* K. J. R. Cuthbert. *James Scott Scholarship in Midwifery and Gynaecology:* G. S. P. Birtwisle. *Conan Doyle Prize:* A. C. Macdonald. *Royal Victoria Hospital Tuberculosis Trust Medal:* D. J. C. Cunningham. *Annandale Medal in Clinical Surgery:* P. M. Roemmele. *Pattison Prize in Clinical Surgery:* G. V. R. Born. *Wightman Prize in Clinical Medicine:* C. W. Shearer. *Murchison Memorial Scholarship in Clinical Medicine:* R. Cruickshank. *Gunning Victoria Jubilee Prize in Zoology:* D. K. M'E. Kevan. *Gunning Victoria Jubilee Prize in Physiology:* A. E. Ritchie. *Lewis Cameron Undergraduate Prize in Bacteriology:* J. M'Lelland. *Colonel Thomas*

Biggam Memorial Medal and Prize in Pathology: J. T. Gray. *Maclagan Prize in Forensic Medicine*: I. M. Richardson. *Cunningham Memorial Medal and Prize in Anatomy*: W. R. St. Clair; prox. acc., R. B. White. *Whiteside Bruce Bursary*: Jean M. Dance. *Vans Dunlop Prize in Botany and Zoology*: D. W. Lyon and Margaret Stirling (equal).

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the College, held on July 20, with Mr. J. W. Struthers, President, in the chair, the following, having passed the requisite examinations, were admitted Fellows:

C. P. Allen, G. W. Baker, D. T. Howell Evans, C. C. M. James, H. Lytton, I. S. McGregor, A. K. Mitting, James Reid, T. R. Simpson, G. F. F. Sinclair, M. Weinlos.

SOCIETY OF APOTHECARIES OF LONDON

At a meeting of the Court of Assistants held on June 22, with Sir Stanley Woodwark, Master, in the chair, Sir Hugh Lett was re-elected as the Society's Representative on the British Postgraduate Medical School; Dr. H. Seaward Morley as delegate to the Representative Committee of the British Medical Association; and Wing Commander R. R. Trail to represent the Society at the 26th Annual Conference of the National Association for the Prevention of Tuberculosis.

The following candidates have satisfied the Examiners in the subjects indicated:

PATHOLOGY, BACTERIOLOGY AND FORENSIC MEDICINE.—J. A. Baldwin, T. L. Benson, D. M. Carnegie, B. A. Gould, D. B. Lawrence, T. Moss, C. D. Sanders, R. M. B. Talbot, R. N. Theakston, W. M. Thomas, B. E. O. Williams.

SURGERY.—S. R. Abrams, A. M. Earle, P. L. G. Cole, C. M. F. Fiducia, I. D. Henderson, J. S. Pegum, A. G. M. Reese, C. D. Sanders, J. H. S. Scarlett, W. Sommer, C. T. Tahil, M. N. Tata, B. E. O. Williams.

MEDICINE.—J. A. Baldwin, R. F. Bates, T. L. Benson, D. M. Carnegie, C. M. F. Fiducia, B. A. Gould, I. D. Henderson, G. R. S. Jackson, D. B. Lawrence, T. Moss, A. M. Rajah, R. M. B. Talbot, B. E. O. Williams, S. Yaffe.

MIDWIFERY.—M. J. Beilin, C. P. Brown, I. D. Henderson, P. S. Hollings, D. B. Lawrence, D. D. Rosewarne, A. J. M. Reese, C. D. Sanders, M. N. Tata, F. R. Walker.

The Diploma of the Society was granted to T. L. Benson, C. P. Brown, D. M. Carnegie, P. L. G. Cole, P. S. Hollings, D. B. Lawrence, P. S. Pegum, A. J. M. Reese, W. Sommer, C. T. Tahil, R. M. B. Talbot, and B. E. O Williams.

The Services

Major (temp. Lieut.-Col.) G. S. N. Hughes, I.M.S., has been awarded the D.S.O., and Capts. B. P. Tully, R.A.M.C., A. Qadir and R. S. Sahi, I.M.S., have been awarded the M.C. in recognition of gallant and distinguished services in the Middle East.

Capt. H. D. Eddy, R.A.M.C., has been awarded the M.C. in recognition of gallant and distinguished services in North Africa.

Capts. R. E. Johnson, M.B.E., and C. S. Smalley, R.A.M.C., have been awarded the M.C. in recognition of gallant and distinguished services in Burma.

Capt. E. T. Gilbert, O.B.E., R.A.M.C., has been awarded the D.S.O. in recognition of gallant and distinguished services in the field.

CASUALTIES IN THE MEDICAL SERVICES

Killed as the Result of an Accident on Active Service Over-seas.—Squad. Ldr. T. D. R. Aubrey, A.A.F.

Killed.—Capt. A. O. Karstaedt, R.A.M.C.

Wounded.—War Subs. Capt. H. C. W. Baker, R.A.M.C., Lieut.-Col. J. W. Orr, M.C., R.A.M.C.

DEATHS IN THE SERVICES

Surgeon Rear-Admiral Sir ARTHUR REGINALD BANKART, K.C.V.O., R.N., died at Kenbrook, Star Cross, South Devon, on June 19, aged 74. He received his medical education at the University of Edinburgh, whose degree of M.B., C.M. he took in 1892, and in 1905 he passed the D.P.H.Lond. His efficiency is also shown by the award to him of the Gilbert Blane gold medal in 1910. As early as 1899 he was appointed surgeon in Queen Victoria's yacht *Osborne* and was transferred to the new *Victoria and Albert* yacht in 1901, on which he served until July, 1914. On the outbreak of war a month later in that year he was appointed senior medical officer to the battleship *Agincourt*, and once more proved his efficiency at the Battle of Jutland and was noted for early promotion. In 1917 he became medical officer of the Portsmouth Marine Division and in 1919 once more joined the *Victoria and Albert* yacht. He was promoted to be surgeon captain in 1920 and surgeon rear-admiral in 1923, and retired at his own request in 1924. At various times he attended members of the Royal Family, and was awarded the M.V.O. in 1898, the C.V.O. in 1911, and the K.C.V.O. in 1923, in addition to being appointed as Honorary Physician to the King. In the course of his distinguished service Admiral Bankart was awarded foreign orders by Turkey, Russia, Greece, and Denmark.

Medical Notes in Parliament

DECLINING BIRTH RATE

The trend of population was debated in the House of Commons on July 16, a discussion being arranged upon the votes for the Ministry of Health, the Department of Health for Scotland, and the Registrar-General's Office. Group Captain WRIGHT, who opened the debate, said it was difficult to interest people in the subject owing to the lack of a Government population policy and the difficulty of obtaining complete statistics. Yet the trend of the population was the base on which Ministers must initiate social improvements during the period of reconstruction. The nation must have a Government population policy and more complete statistics. Britain had over 2,000,000 fewer children under the age of 14 and 2,500,000 more persons over the age of 60 than in the last war. There were 1,500,000 fewer children than at the time of the Boer War and, in fact, fewer children than in any year since 1876, when the total population of the country was 24,000,000. In 1971, though the total population would be approximately the same as now, there would be 50% more people over the age of 45 than there were to-day, and 100% more people over 65. The number of people aged 45 and under would be only 75% of what it was to-day.

The net reproduction rate showed the number of girl children who survived to replace in the next generation the women of reproductive age in the present. Since the early 1930's the net reproduction rate had been about 75%. At that rate the nation must lose a quarter of its population every generation, which could be considered as being a period of 30 years. If the present death rate of those under 45 were halved it would still lose nearly a fifth of its numbers every 30 years. By 1971 the population would have declined by 25%. To prevent a decline it would be necessary to increase the average size of families by one in three at once, which was clearly impossible. Statistics had just been published by the Registrar-General to show that the birth rate for the March quarter had risen to 16.8, the highest for fifteen years. There was no mention that in 1917, after a precipitous decline of 26% during the first three years of the last war, the birth rate was then 17.8. During the last war, in spite of the great prosperity of the people, the birth rate persisted in falling. Not only in this country but almost throughout the world a declining birth rate had gone hand in hand with improved conditions. The most advanced countries, generally speaking, were those with the lowest rate. The removal of the unequal burden on the married man was the key to the whole problem if they agreed that children were a national asset.

Miss RATHBONE said the lowest birth rate of all was found among ministers of religion, doctors, and teachers. They represented the intelligent persons who were not willing to have large families in present circumstances. Only a few municipalities had introduced a scheme of rent rebates in respect of dependent children where the family income fell below a certain standard. Mr. JAMES GRIFFITHS said a large number of women had one child and refused to have another. It was essential to make motherhood safer. Another reason for the fall in the birth rate was that women increasingly desired a career and the social system compelled women to choose between a career and motherhood. A system must be devised whereby both were possible. Mrs. BEATRICE WRIGHT considered that many women were permitted under war conditions to stay at their work too long and to resume it too soon after their babies were born. Family allowances would meet this.

Fertility and Contraceptives

Captain ELLISTON said a modest start in dealing with the problem of declining fertility was made in 1937 when the Government brought in the Population (Statistics) Bill. That Bill had been treated with levity from the moment of its introduction. They were told that there was no evidence of increasing physical sterility, but that there was a deliberate policy adopted by parents to limit their families to one or two so that children could be brought up in greater comfort and security and with greater educational advantages. Some health experts said that by passing a Bill to prohibit the sale of contraceptives the problem would be settled. Others were not sure the availability of contraceptives was wholly responsible for the fall in fertility. Lord Geddes, during a discussion in the House of Lords, had suggested that the decline in fertility was a biological problem and that the germ plasm had ceased to be actively reproductive. Research had been made into similar symptoms in the case of pedigree cattle, and if pre-

tutions were taken with cattle, could not provision be made for research when the preservation of human beings was concerned? Scientists had not yet reported whether the long-term effect of contraceptives rendered women less liable to pregnancy when that condition was desired. These matters called for inquiry by some such body as the Medical Research Council, the Royal Society, or the universities. Dr. EDITH SUMMERSKILL said contraceptives had been prohibited in France for many years, but the birth rate was still declining rapidly. In this country the woman in industry had to go on working until far advanced in pregnancy because she did not receive National Health Insurance benefit. Service allowances were so small that she was forced to remain in industry. Maternity accommodation was overcrowded. The Government had done nothing in these matters.

Sir FRANCIS FREMANTLE said the declining birth rate had resulted in the loss of leaders. But those who condemned contraceptives lent aid to a tendency, which the medical profession knew too well, toward abortion, although not, as in ancient Rome, toward infanticide. Among the younger generation during this war sexual promiscuity seemed almost the rule in large cities. That was the natural result of contraceptives and of the urge of life if there were no spiritual or moral authority against it. The medical profession was alarmed because the use of contraceptives was believed to be responsible, though they did not know to what extent, for some of the unwanted sterility at present. It seemed clear that the virgin womb was affected by contraceptives with a sterilizing result. There was a great deal of unwanted sterility at present. They might discuss whether contraceptives should be distributed to the unmarried under a certain age, or sold only under a definite certificate from the justices or from the medical profession. Lady ASTOR said it had been known for years that out of 600,000 children born 25,000 were stillborn, that 35,000 died before the age of 1, and that 11,300 died between the ages of 1 and 2. Remedies were available for these evils.

"Exceptional" Rate of Last Century

Mr. ERNEST BROWN, replying to the debate, said it was true that information was incomplete as to the numbers of families with one, two, three, or other numbers of children, or as to differences in family patterns exhibited by different occupational groups. That information could be obtained only by a census, which would have been taken in 1941. With families broken up and dispersed as they were to-day, and with the large proportion of parents in the Forces, the information obtainable from a census would be of little value. That inquiry must be postponed until conditions became more settled, and then it would be made. It was a misreading of the problem to regard the reproduction rates of the nineteenth century as normal. The high reproduction rates then experienced in this and other Western nations resulted in exceptional growth of population, which had been characterized as "one of the great population surges of history" In Great Britain the population more than trebled during a hundred years, and thereafter increased to its present size of between 46,000,000 and 47,000,000, with a density in area which was the highest in contemporary record. If the nineteenth-century rate of growth had continued the population by the year 2001 would rise to 111,000,000. A check had to come sooner or later, and it did come. He would not say that that check had not gone perilously far, but there was no justification for expecting a further decline in the birth rate solely by reason of what happened in the different circumstances of the past.

Promise of Government Inquiry

The rate ceased to fall in 1933, and with the improvement in economic conditions after 1932 had shown a small increase since that time. The response of the birth rate to changes in employment had been marked over the whole period of 1924 to 1939. The curve of the birth rate followed that for unemployment with remarkable fidelity, showing that economics had a big effect. Between 1914 and 1918 birth rates fell precipitously, whereas in this war, though small decreases were recorded in 1940 and 1941, they were more than restored in 1942 by a rise to a position not previously reached since 1931. They had had six successive quarters in which there had been increases, and there was a prospect of further material improvement this year. That recovery had been aided by the high marriage rates, and these by raising the proportion of young married women in the population, must have prolonged influence on fertility. The vital statistics affecting mothers and young children had improved. Last year England and Wales had the lowest rates on record for maternal mortality, stillbirths, and infant mortality and the lowest death rate from diphtheria. That was a tribute to the co-operation of Government, local government, and voluntary effort. In the fourth year of the war young children were healthier, taken all round, than they were in peacetime.

The Government intended to institute an inquiry on the broadest basis into the whole question of birth rate and population. The form of the inquiry and the terms of reference were matters for early decision. No such inquiry would be valuable without the full participation of women, and particularly of women who had experience of motherhood. A census would be taken at the earliest time when the Government was satisfied that it would gain a true result.

The debate then concluded.

Specialists in the Army Medical Services

On July 14 Sir JAMES GRIGG informed Mr. Rhys Davies that there were psychiatrists serving in the R.A.M.C. many years before the war, but the first new appointment after the outbreak of war was made on Sept. 8, 1939. There were 198 now serving. Since the beginning of the war about 23% of those discharged from the Army on medical grounds had been discharged for psychiatric reasons.

Sir James Grigg also informed Mr. Naylor that the following categories of specialists were employed in the Army Medical Services: physician, neurologist, physical medicine, dermatologist, physiologist, pathologist, psychiatrist, venereologist, hygiene, malariologist, entomologist, surgeon, radiologist, ophthalmologist, oto-rhino-laryngologist, anaesthetist, neurosurgeon, maxillo-facial surgeon, orthopaedic surgeon, and gynaecologist. They were primarily engaged on their specialist duties. If there happened to be a shortage of general duty officers, they might, however, be required in addition to undertake general medical duty.

Detention Barracks Inquiry

Mr. CHURCHILL, in reply to Mr. Bellenger on July 20, said that Mr. Justice Oliver had consented to be chairman of the Court of Inquiry into detention barracks. The other members would be the Bishop of Reading and Lord Moran. These three distinguished men, though belonging to very different vocations, all gained the Military Cross for gallantry in the last war, and were, therefore, acquainted with military matters. The inquiry would be held in private and not under the Tribunals of Inquiry Act, 1921. The report would be published.

Mr. SHINWELL: While not questioning the intelligence or bravery of the distinguished persons to whom the Prime Minister has referred, can he say whether any of them at any time have ever been incarcerated? Mr. CHURCHILL: That has never yet been made an indispensable condition for membership of a public inquiry!

The following are the terms of reference: To inquire into and report on the treatment of men under sentence in naval and military prisons and detention barracks in the United Kingdom, and whether it is in accordance with modern standards and satisfies wartime requirements. The investigation will cover, *inter alia*, the supervision and administration of discipline, medical care, training, welfare, accommodation, feeding, and the suitability and adequacy of the staff.

Pay of Mental Nurses.—Lord SNELL in the House of Lords on July 8 announced that a subcommittee in association with the Rushcliffe Committee would be appointed to draw up agreed scales of salaries and emoluments of nurses in mental hospitals and mental deficiency institutions in the light of the recommendations made by the Rushcliffe Committee. The chairman of the subcommittee would be appointed by Mr. Ernest Brown.

Reasons for Discharge from Army.—On July 13 Mr. HUTCHINSON asked the Secretary of State for War whether he would give instructions that the entry in the discharge papers issued to a soldier discharged as no longer physically fit for service would be so expressed as to make plain the reasons for discharge. Sir JAMES GRIGG replied that the inclusion on the discharge certificate of the specific nature of the disability would, in many cases, be to the detriment of the ex-soldier who in seeking employment was asked to produce his discharge documents. It was therefore considered that no change should be made in the present practice.

Batteries for Deaf-aid Appliances.—Mr. DALTON, replying to Sir Jocelyn Lucas on July 13, said he fully appreciated the importance of maintaining the supply of batteries for deaf-aid apparatus; and he was aware that, owing to urgent war contracts, there had been some shortage recently of certain types of batteries. He hoped that, as a result of arrangements which he had now made, the manufacturers would soon overtake arrears.

Notes in Brief

During a discussion in the House of Lords on the Catering Wages Bill Lord Snell said that hospitals, so far as kitchen staff were concerned, would come under the Bill like any other undertaking.

Legislation is under consideration to give effect to recommendations of the Interdepartmental Committee on the Rehabilitation and Resettlement of Disabled Persons.

Medical News

On June 1 Major-General Norman T. Kirk succeeded Major-General James C. Magee as Surgeon-General of the United States Army, and a few days later addressed the House of Delegates of the American Medical Association at its opening session in Chicago.

The Association of Speech Therapists will hold a conference on Thursday and Friday, Aug. 5 and 6, in the Hastings Hall at B.M.A. House, Tavistock Square, W.C. On Aug. 5 at 11 a.m. Dr. C. Worster-Drought will speak on "Congenital Auditory Imperception and its Relation to Speech Defects," and at 3.15 p.m. Dr. Helen Doris Watson on "Relaxation."

A special general meeting of the British Institute of Radiology incorporated with the Röntgen Society will be held on August 7 at 2.30 p.m. in the Reid-Knox Hall of the Institute, 32, Welbeck Street, W.

At a meeting recently in the Albert Hall Sir Peter Chalmers Mitchell, treasurer of the Joint Committee for Soviet Aid, handed to M. Maisky, the Ambassador of the U.S.S.R. in Great Britain, a cheque for £40,000 towards the Stalingrad Hospital Fund. More money is still needed for this, and contributions should be sent to the Joint Committee, 171, St. Stephen's House, Westminster, London, S.W.1.

The issue of *Archives of Surgery* for May, 1943, is dedicated to Dr. Robert B. Osgood, professor emeritus of orthopaedic surgery at the Harvard Medical School.

The Sixth Addendum to the *British Pharmacopoeia*, 1932 (see *Journal*, June 26, p. 797), will be published on Aug. 1, 1943, and become official from that date.

At the recent conference of the Liberal Party a resolution on "Land and Housing," asking that the Minister of Town and Country Planning should have adequate powers to make and enforce a national plan for necessary reforms, was amended without dissent to include "the progressive elimination of the smoke nuisance."

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* during the week there was little change in the trends of infectious diseases, although measles notifications fell by 572. The returns for diphtheria were 28, acute pneumonia 28, dysentery 27, and scarlet fever 25 fewer than in the preceding week; the returns for whooping-cough rose by 35.

In the counties the largest falls in the measles figures were in Monmouth by 110, in Essex by 96, in Surrey by 70; and the only notable rise was that of Somerset, 38. The 71 cases recorded in Cambridge constituted the largest weekly total recorded in this country during the present epidemic. Since March, when the epidemic was at its height, the geographical distribution has changed, and the disease is now, proportionately, more concentrated in the South. The proportion of cases in the combined divisions of London, South-East, and South-West is now 35% of the whole country, compared with an average of 25% during March, while the proportion for the Yorkshire, North-West, and Northern divisions has fallen from 27 to 20%.

The only variations of note in the trends of the other infectious diseases were 39 fewer cases of scarlet fever in London and 35 more in Yorks West Riding; the notifications of whooping-cough were up by 52 in Yorks West Riding.

The fall of 27 in the notifications of dysentery has brought the total below the 100 level for the first time for eight weeks. A fresh outbreak occurred in the rural districts of Wiltshire, attacking 8 persons. There were 14 more cases in Bristol C.B. The other large returns were London 12 and Yorks West Riding 10.

In *Scotland* the incidence of measles was down by 137, of diphtheria by 45, and of whooping-cough by 39 cases; but that of scarlet fever rose by 8. The number of cases of dysentery remained unchanged at 64, the chief centres of infection being Edinburgh 12, Aberdeen 11, Dundee 10.

In *Eire* the rise in the notifications of measles was due to an outbreak in Co. Kerry, Gort R.D. 18.

The Week Ending July 17

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 2,082, whooping-cough 2,110, diphtheria 571, measles 3,054, acute pneumonia 457, cerebrospinal fever 51, dysentery 160, paratyphoid 11, typhoid 11.

No. 27

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended July 10.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1943 (a)	(b)	(c)	(d)	(e)	1942 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	49	4	26	3	3	87	5	37	3	
Deaths		1	—					1		
Diphtheria	580	45	118	59	30	768	34	131	50	2
Deaths	13	1	2	1	—	13	1	4	1	—
Dysentery	93	12	64	1	—	155	15	53	—	—
Deaths		—	—	—	—		—	—	—	—
Encephalitis lethargica, acute	2	—	—	1	—	3	—	—	—	—
Deaths		—	—				—	—		
Erysipelas			34	4	2		—	40	8	
Deaths		—	—				—	—		
Infective enteritis or diarrhoea under 2 years				44					98	
Deaths	42	10	8	14	9	45	5	9	4	
Measles	3,593	168	97	29	3	7,361	737	231	97	20
Deaths	—	—	1	—	—	4	1	5	—	—
Ophthalmia neonatorum	82	3	22	—	—	106	4	29	2	—
Deaths										
Paratyphoid fever	12	—	1	—	—	8		5	2	
Deaths	—	—	—		—			—		—
Pneumonia, influenzal*	502	19	2		6	625	39	1	—	5
Deaths (from influenza)	9	1	5	—	—	9	2	—	—	—
Pneumonia, primary			195	23				172	17	
Deaths		15		8	2		—		13	5
Polio-encephalitis, acute	2	1				—	—			
Deaths		—					—			
Poliomyelitis, acute	6	3	2	—	—	5	—	—	1	—
Deaths		—					—	—		
Puerperal fever		4	24		—	—	—	20	4	—
Deaths		—					—			
Puerperal pyrexia†	125	8	18	—	1	182	12	12		—
Deaths		—								
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,959	132	209	40	44	1,297	59	288	51	22
Deaths	—	—	—	1	—	—	—	—	—	—
Small-pox	—	—	—		—	—	—	13		—
Deaths	—	—		—	—	—	—	—	—	—
Typhoid fever	8	2	4	12	4	4	—	1	7	1
Deaths	1	1	—	—	—			—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—			—	—	—
Whooping-cough	2,284	100	94	28	30	1,390	127	21	55	23
Deaths	8	2	3	1	—	3	—	1	—	—
Deaths (0–1 year) Infant mortality rate (per 1,000 live births)	293	43	42	30	28	256	29	67	18	18
Deaths (excluding still-births)	3,591	560	601	194	115	3,574	482	582	158	124
Annual death rate (per 1,000 persons living)			13·5	12·8	‡			13·1	10·5	‡
Live births	6,418	762	995	386	275	6,144	650	872	386	251
Annual rate per 1,000 persons living			20·3	25·4	‡			18·0	25·8	‡
Stillbirths	172	20	28			215	19	26		
Rate per 1,000 total births (including stillborn)								29		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Secretary of the Journal Board, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and subscriptions should be sent to the Secretary.

TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES.—EDITOR, *Aitiology Westcent, London*; SECRETARY, *Medisecra Westcent, London*.

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

ANY QUESTIONS?

Risks of the Rh Blood Factor

Q.—*What steps can be taken to avoid the death of the foetus where the father has the Rh-positive factor in the blood and the mother has not? How is the diagnosis made? Is it necessary to get samples of blood from both mother and father? What is the treatment? Does the treatment begin before the birth of the child? Is it wise to test every pregnant woman (i.e., primipara) for presence of Rh factor in the blood?*

A.—At present no method is known of preventing anti-Rh agglutinin in an Rh-negative mother's serum from killing her Rh-positive foetus. It may be that, if in future we can isolate a polysaccharide responsible for the specificity of the Rh antigen, its injection into the mother may neutralize her anti-Rh and prevent or diminish its harmful effect on the foetus. Although no treatment is possible before delivery, steps can be taken during pregnancy to ensure that proper treatment is available if it is needed when the child is born.

Ideally the Rh position would be investigated in every pregnancy. That a woman is Rh-positive does not mean that she and her children are certain to be free from trouble caused by Rh. Erythroblastosis foetalis has been caused by an Rh-positive mother making an unusual type of anti-Rh which clumps the red cells of all Rh-negative and those of many Rh-positive persons, including the child's. This unusual antibody, anti-Rh, may be formed when the husband and the foetus, as well as the mother, are Rh-positive. Nevertheless, 90% of erythroblastotic babies have Rh-negative mothers, and when a woman is known to be Rh-negative it is wise to remember this. Rh may cause erythroblastosis in a first baby, but only very rarely, and there is some evidence that when a first-born is affected the mother is most often Rh-positive. In the immediate future, at any rate, it seems that investigations will be confined mostly to cases where erythroblastosis has occurred or is suspected, or where there has been a series of miscarriages or still-births. Only one person in seven is Rh-negative; in one mating in eight the mother is Rh-negative and the father Rh-positive; and in one pregnancy in ten the mother is Rh-negative and the foetus Rh-positive. So it is clear that the Rh factor causes trouble in only a small proportion of the pregnancies in which the Rh groups make trouble possible.

To investigate a case samples of blood from mother, and, if possible, from father and all their children, should be tested for the A B O and Rh factors, and the mother's serum examined for the presence of anti-Rh or other irregular agglutinins. The Rh antigen is detected by the red cells containing it being agglutinated when mixed with anti-Rh sera. Mothers of erythroblastotic babies or people who have had transfusion reactions due to Rh form the most convenient source of antisera. Anti-Rh or other unusual agglutinin in the mother's serum is sought by seeing whether the serum will clump red cells from a panel of donors chosen to cover the range of known antigens. Rh tests should be made in tubes and not on a tile or slide; some experience is needed to make and interpret them properly. With a suggestive history, finding that the mother is Rh-negative makes it very likely that erythroblastosis will affect the children; knowing that the father is Rh-positive increases the chances, and if anti-Rh is found in the mother's serum trouble is almost certain. When such findings are made during pregnancy it should be arranged that O Rh-negative blood is available in case either the newly born baby or the mother should need transfusions.

As soon as a diagnosis of erythroblastosis foetalis has been made—and where there is a previous history the cord blood should be examined at once—the child should be transfused with O Rh-negative blood. The blood should be injected into the veins, not into the muscles. The mother's whole blood, although Rh-negative, should not be used, for its plasma will almost certainly contain the harmful antibody. If no other negative blood is available, and if the A B O groups permit, the mother's cells washed free from plasma may be injected. If Rh-negative blood is not available from any source the child may have blood from a group O donor taken at random, but such blood will usually be Rh-positive and may cause a transient jaundice. It is better to seek a donor among the mother's relatives than to use the father or his relatives—the chance of the donor being Rh-negative is greater.

Treatment of Tapeworm Infection

Q.—*I should be very glad of advice on the treatment of a patient with a tapeworm (Diphyllobothrium latum). My routine has been to starve her to begin with, then to give alkaline drinks to remove mucus, and finally to administer extract of male fern. This treatment has on several occasions brought away large segments, but the head obstinately remains behind. If the tapeworm wins, I lose a patient.*

A.—For two days before specific treatment food should be restricted to coffee, tea, toast-and-butter, breakfast cereals, eggs, and glucose. During these two days 1/2 teaspoonful of sodium bicarbonate stirred into a tumbler of water should be taken four times daily. On the day of treatment sodium sulphate, 200 gr., should be taken in hot water at, say, 7 a.m. This may be followed by a drink of hot tea without milk. At 8.30 a.m., 9 a.m., and 9.30 a.m. 30 minims of extract. filicis liq. should be taken. The patient must lie in bed during this time, and at 11 a.m. a further dose of sodium sulphate should be taken. If this fails to produce the desired effect, recourse may be had to carbon tetrachloride. The same preliminary starvation and purging should be carried out, and 3 c.cm. of the drug and 1 c.cm. of oil of chenopodium emulsified in liq. paraffin (30 c.cm.) should be taken. Carbon tetrachloride is not devoid of danger on account of toxic action on the liver. A saline aperient should be taken within one hour.

Ending Lactation

Q.—*When for any reason it is not advisable for a woman to feed a child on the breast, will administration of oestrogens suffice to prevent lactation? What, for example, should be the dosage of stilboestrol in such cases, and for how long should it be given? Similarly, are oestrogens useful in terminating lactation at the usual time, and are supplementary measures advisable or to be preferred?*

A.—Lactation can be prevented or suppressed with oestrogens in nearly every case providing the dosage employed is adequate. No supplementary measures are necessary. Begin treatment as soon as possible after delivery and give 5 mg. stilboestrol twice by mouth for the first day Thereafter reduce the dose at the rate of 1 mg. a day, completing the course of treatment in ten days. Gradual reduction of the dose is important. Oestrogens are equally efficacious in suppressing breast activity at any time after delivery and even when lactation has been in progress for several months.

Sudden Loss of Hair

Q.—*A newly retired schoolmaster, aged 64, two years ago and in the space of about 2 or 3 weeks suddenly became completely hairless. There has been no indication that the hair might be growing again since that time, and he still has no need of a razor. Apart from this he is apparently completely fit. Both he and I will be grateful for (a) suggestions for treatment, and (b) indications of the prognosis either with or without treatment.*

A.—Total alopecia is usually the result of shock or severe acute anxiety. Apart from the very rare occurrence of Simmonds's syndrome following shock, there is no real evidence that this alopecia occurs via the hypothalamic-pituitary neuro-endocrine mechanism, although one is tempted to advance some such hypothesis. Against it, however, is the absence generally of any other endocrine manifestation. Further, hypogonadism, especially complete castration before puberty, is associated with little or no hair on the face and pubis, but much hair on the head, and a tendency to retain it throughout life. On the other hand, virile men with full sexual potency may go completely bald, and virilized women lose the hair of the head. From the endocrine point of view, therefore, there is a dissociation between the hair of the head and the hair of the face and pubis. From the point of view of treatment, testosterone might be helpful in restoring the hair of the face (and sexual potency if such were lost), but would have no effect on the hair of the head. Thyroid has been given traditionally, but it is doubtful if it is effective. Psychotherapy is indicated.

Hodgkin's Disease

Q.—*A boy of 12 suffering from lymphadenoma has been relieved by operation followed by x-ray treatment. X-ray treatment is now suspended and the possibility of vaccine treatment is being considered, as this has been under trial for some time. Can you supply information as to the nature of the vaccine and where it may be obtained?*

A.—Coley's fluid was probably the first bacterial inoculation used in the treatment of Hodgkin's disease and it is still occasionally employed. A few successes have been reported. The fluid contains

the combined toxins of *Streptococcus erysipelatis* and *B. prodigiosus*, and it should be obtainable from any large pathological laboratory. It is injected daily, in the neighbourhood of the glands if there is still any lymphadenopathy, in a dose of 0.25 to 0.5 minim, and if little or no reaction is obtained the dose is increased by 0.25 or 0.5 minim daily until a rise in temperature of 102° to 104° is reached. The injections are then continued till the reactions calm down and the temperature falls. Over ten years ago the view was advanced that Hodgkin's disease was a form of avian tuberculosis, and an antiserum was prepared by inoculating chickens with lymphadenomatous tissue. This serum was completely ineffective in treatment. More recently Gordon demonstrated the presence of an encephalitogenic agent in the glands in Hodgkin's disease and treated a few cases with a " sensitized vaccine " obtained from material from the glands. It is not generally believed that the encephalitogenic material is a pathogen, for similar material can be obtained from normal human marrow and occasionally from leucocytes. Preliminary reports of the treatment were not encouraging. Details of preparation of the vaccine were given by Gordon (*Proc. roy. Soc. Med.*, 1936, **30**, 541), but it is not available commercially.

Visceral Lesions after Muscular Action

Q.—*Is there any evidence that the contraction of the abdominal muscles which takes place in the lifting of heavy weights can cause any visceral lesion (such as gastric ulcer) in the male subject, apart from hernia?*

A.—The relationship of visceral lesion to injury of the abdominal wall is one which is frequently under discussion in the law courts, usually without much " conviction " on either side. That violent injury to the abdominal wall can damage the underlying viscera is beyond doubt, but this question concerns the effects of muscular contraction. The great mobility of the majority of the viscera within the peritoneal cavity is a provision against injury as a result of muscular action, but with this protective mechanism adhesions might obviously interfere. It may therefore be fairly stated that it is highly improbable that such a disease as gastric ulceration could arise from parietal muscular contraction. But while it is impossible to state categorically that no visceral disease could in any circumstances be produced by muscular action, it is equally impossible to produce incontrovertible proof that such conditions can be so produced. In most cases in which it is alleged that the disease was the result of muscular action the truth is that the first evidence (pain or tenderness) of the onset of the condition was produced by some muscular contraction, but that the disease itself pre-existed. This is often demonstrated in appendicitis.

London Paste

Q.—*Is it safe to use " London paste " for reduction or destruction of diseased tonsils?*

A.—There is no particular danger in the use of London paste, which is a strong caustic, if care is taken to ensure that it is applied only to the surface of the tonsil and is neutralized by some weak acid after application. It produces a superficial slough, followed by fibrosis and scar formation which seals the crypts and causes retention of secretion in the remainder of the tonsil. Dissection of the tonsil afterwards is therefore much more difficult. Morell Mackenzie (*Diseases of the Nose and Throat*, vol. 1, p. 36, J. and A. Churchill, London, 1880) recommended applications on his spatula for granular pharyngitis. It does not appear that he either attempted to destroy the tonsils with it or recommended this. The answer to the question must be that there is no immediate danger to the patient, but that London paste cannot possibly succeed in a complete removal of the tonsil, leaves remote ill effects, and is not safe for the reputation of a practitioner who employs such a discredited method of treatment.

INCOME TAX

Deduction of Professional Subscriptions

E. B. holds an appointment at an E.M.S. hospital under the Ministry of Pensions. He has claimed to deduct sums paid as subscriptions to the B.M.A. and various other professional associations, but is informed that they are not allowable as he is assessed under Schedule E.

*** It is understood that a Government Department does not require its officers to belong to the associations in question, and if so the subscriptions are not allowable for income-tax purposes. The question was before the Court in a similar case (Simpson *v.* Tate) in 1925, and a decision was given in favour of the Revenue's view that such an allowance is prohibited by the strict rule applying to Schedule E assessments. In his judgment Mr. Justice Rowlatt observed: " I think that all subscriptions to professional societies, and all taking in of professional literature, and all that sort of expense which enables a man to keep himself fit for what he is doing, are things which can none of them be allowed."

LETTERS, NOTES, ETC.

Plugging Tooth Sockets

Mr. F. ELLIOTT SMITH, M.R.C.S., L.D.S. (London, W.1) writes: With reference to the reply (July 3, p. 30) under " Any Questions? " to a query as to the treatment of haemorrhage after tooth extraction, may I refer to the reply of Mr. Angelman (Oct. 24, 1942, p. 504) to a series of letters on the plugging of tooth sockets, and ask, as he did, why it is done. Unfortunately, at the time it is effective. The after-effect, at the best, is an open socket to collect food debris; at the worst, an entry for infection with a risk of a " dry socket," which is painful and very obstinate to treat. In the majority of cases digital pressure on the sides of the socket and gentle firm pressure on a pad of gauze, with or without a composition splint, followed, if necessary, by a stitch or two, will stop the bleeding. The patient should be told to keep quiet, avoid stimulants, and not lie flat. With reference to the composition splint, prolonged vertical pressure on a pad is very apt to " mushroom " the socket and tissues again, and therefore the side pressure given by the splint is a help. Styptics and haemostatics are of doubtful value, with the possible exception of calcium prophylactically (a controversial point) and morphine, as part of the treatment. I would suggest, to the dental surgeon—avoid laceration; and to the doctor—that plugging should be forgotten and that pressure and stitching will be effective and better treatment. Haemorrhage due to blood and general conditions will call for different treatment—for example, transfusion given early. The dentist should himself treat the damage done, as the doctor will justly retort.

Two Cases of Epilepsy

Dr. A. W. DAVISON (Stretford, Manchester) writes: The occurrence of incontinence in the two cases of epilepsy referred to in " Any Questions? " (July 17, p. 93), during the attacks, suggests a diagnosis of narcolepsy. Try benzedrine sulph. 10 to 20 mg. or ephedrin. hyd. gr. 1/2 m. et n.

Public Vaccination

Dr. M. F. MCDONNELL (Northfleet, Kent) writes: Perhaps in these days of petrol shortage the following suggestion may be of some use to public vaccinators, especially those with large rural districts composed mainly of isolated hamlets. I have found by experience that quite a large proportion of the mothers go out to some form of daily work, and that time and petrol are wasted on fruitless calls at their homes, when one is informed (provided one is lucky enough to find anybody at home) that mother has taken baby to work on " So-and-so's farm," etc. As soon as I am aware of the existence of a baby I send a stamped addressed postcard with the following on the reverse side:

* Please call to vaccinate baby on .....
* I do not wish to have baby vaccinated .....
* Baby has been vaccinated by Dr. .....
* Please cross out as necessary. Return card immediately.

I might add that more than 60% of the babies in this area are vaccinated.

First Aid for Fractured Spine

Mr. DESMOND MULVANY (Hospital of St. John and St. Elizabeth, N.W.8) writes: With reference to Dr. Moir's letter (May 15, p. 614) regarding first-aid treatment for fracture of the spine, I consider that if there is to be any drastic change in the teaching on this subject the suggestion should come direct from the British Orthopaedic Association to the various organizations concerned, and not from any one individual. Alternatively these bodies could submit to the Association the present-day first-aid treatment, with which it is not necessarily familiar, and request that an alternative line of treatment should be drawn up if it was deemed advisable. Personally I consider the present St. John's teaching to be quite satisfactory. It deals with a difficult subject in a most concise and lucid manner; I feel that any further alternative methods would only confuse the issue.

Invasion of Earwigs

Dr. G. STEPHENS (Windsor) writes: In your *Journal* of July 10, p. 62, there is a reply to a question about an invasion of earwigs. For many years I had been worried with invasions of these pests. The only relief I found—and it was a perfect cure against these insects in the house—was to paint a continuous line, about one inch in width, completely round the house, with " sticktite " or some other fruit-tree band preparation. If this line comes just below the doorstep it will not inconvenience anyone. But wireless earth wires, and the stems of creepers or trees that may be touching the wall anywhere, must have their own ring of " sticktite."

Exchange of Raincoats

Mr. D. C. DICKSON, F.R.C.S.Ed., 10, Woodlands Road, Middlesbrough, writes: Will the surgeon who took the wrong Warwick Dunlop raincoat at the Royal College of Surgeons meeting on Wednesday, July 21, communicate with me, as I have his coat.